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Original Articles

THE SYMPTOMATOLOGY AND FUNCTIONS OF THE OPTIC THALAMUS *

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SYMPTOMATOLOGY

Some years ago I wrote several papers on the subject of the bilateral temperatures in cerebral hemorrhages, and came to the conclusion that cerebral hemorrhages of any importance caused a slight rise in the temperature on the paralyzed side, a phenomenon which did not occur in acute softenings and which had, therefore, some diagnostic value. I further found that there was no particular area in the cerebral hemispheres which seemed to have definite relation to rise or fall of the bodily temperature—in other words, no specific heat center, such as physiologists seem to be able to find in experimental studies on lower animals. Pursuing a somewhat similar line of investigations as regards blood pressures on each side of the body after cerebral hemorrhages, using the Riva-Rocci and Janeway apparatus, I found that, as a rule, there was a difference of several millimeters of mercury in the two sides, there being a lower pressure on the paralyzed side than on the sound side. This unilateral fall in blood-pressure is present very soon after the attack and continues for one or two weeks. The general blood-pressure usually falls during this time, and, as it does this, the blood-pressure on the two sides becomes gradually equal, even though the hemiplegia continues; hence the drop in pressure is not due to muscular paralysis. This final equalization of pressures, however, I found did not always take place. In one patient, who had had his hemiplegia for six years, I found a difference in blood-pressure sometimes of 15 or 20 mm., the pressure being lower on the affected side. For example, on one occasion, the blood-pressure on the right side was 200 and on the left side 150. On another occasion the difference was only 10, the pressure being 160 on the normal side and 150 on the paralyzed side. This patient's hemiplegia had features which indicated an involvement of the optic thalamus. His hemiplegia was not accompanied by contractures, and the arm and fingers of the hand hung straight to the side. The hemiplegia was not very great. The patient's grip was fairly good and he could walk quite well. He had no ankle-clonus and no Babinski phenomenon. While there was no anesthesia or ataxia on the affected side, he suffered intensely from central pain, complaining of a burning and soreness all the time, as well as a great deal of tenderness and hyperesthesia on the paralyzed side. He had, however, no hemianopsia, no disturbances of the ocular muscles or of the pupillary reflexes. The hemiplegia had at first been very much more marked, and was accompanied by ankle clonus and Babinski, but this had gradually disappeared, leaving, to a great extent, only a hemisensory disorder. There was evidently, also, some vasomotor disturbance on this paralyzed side, for the hand was puffy and reddened, and the circulation was evidently sluggish. This altogether formed a fairly good syndrome of the thalamic lesion, and it led me to investigate the blood-pressure in such other cases as I could observe. So far these have been only two. In both of these there was a fairly good thalamic syndrome, with a difference in blood-pressure of between 5 and 10 mm. I have not been able to discover such marked differences in blood-pressure in other old hemiplegics who did not present evidences of a thalamic involvement. Still, this part of my investigations is not finished, and I only present these points as suggestive and worthy of further investigations.

During this time, my interest being aroused in the symptoms due to thalamic lesions, I collected three reports of cases, with autopsies, which had come under my observation at Bellevue Hospital during recent years, and, at the same time, I was fortunate in observing a patient under the care of the late Dr. Loomis, who had a hemiplegia, with thalamic symptoms, and who subsequently died. The autopsy showed a very well-defined lesion, involving the inner portion of the thalamus.

I have studied the symptoms of these four cases and collated them with the studies of three other cases in which there were no autopsies, in order to see how far the records would corroborate preceding observations regarding the symptoms of thalamic lesions. In acute lesions there are three groups of symptoms: one consisting of such symptoms as disturbance of intelligence, due to the general effects of an insult to the brain; second, a set of symptoms due to the pressure of the thalamic lesion on surrounding parts, or the involvement, to some extent, of these parts, and, third, disturbances due to an injury of the thalamus itself.

1. The general symptoms vary, naturally, very much, with the condition of the patient, and have little bearing on the question of localization. Some of my patients, for example, were alcoholic; one had a beginning tuberculosis and terminal pneumonia, and two others had very extensive general cerebral arteriosclerosis.

2. The symptoms due to involvement of or pressure on neighboring parts of first importance were those causing the hemiplegia. This is due to the clot pressing on or tearing the internal capsule, so that in almost all lesions of the thalamus there is at first a hemiplegia, with usually exaggerated reflexes and signs of involvement of the pyramidal tract. These symptoms, after a

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longer or shorter time, pass away in great part, leaving often an almost flaccid hemiplegia. With the hemiplegia there is always some anesthesia, which involves both the superficial and deep sensibilities, so that there may be some hemiataxia as well as hemianesthesia. This anesthesia improves, but, as a rule, it does not entirely disappear, so that finally the patient is left with a sensory hemiplegia largely. The other extrathalamic symptoms were those due to involvement of the corpora quadrigemina and mid-brain. These in my cases consisted only in inequalities of the pupils and paralyses of eye reflexes. Disturbances of ocular movements and forced movements of the body, and choreic and athetoid movements, might be expected, and have been observed, but were not present in my cases. The same may be said of hemianopsia, which occurs when there is involvement of the primary visual centers, including the lateral geniculate body and posterior corpora quadrigemina or the tracts connected with these.

3. The most definite symptoms of thalamic lesion alone seem to be central pain, some anesthesia and perhaps some hemianopsia. The latter two symptoms may be caused also by a lesion that is extrathalamic. Whether vasomotor and temperature changes occur or the visceral centers can be affected is yet to be proved; but the more recent cases which I have observed seem to indicate that at least extensive lesions in the thalamic territory or zone do cause such results. The pain involves the paralyzed side only; it involves the arm and hands most, the leg and foot next, rarely the head; it is more severe in the peripheral segments of the limbs, i. e., the hands and feet; it may be very distressing and intense. It is usually different from the ordinary kinds of pain, being a sort of burning discomfort, much more distressing, apparently, than sharp or aching pains, and often making the patient's life a burden. Even when the pain is only a slight dysthesia, it seems to annoy the patients intensely. Sometimes the pain is said to be neuralgic and shooting in character. I have not noted such cases.

In all my patients with autopsies there were changes in the pupils. They were usually unequal and one or the other was rigid.

In none of the cases have I observed the so-called paralysis of emotional expression, and in none have I observed any decided explosive laughter or crying, unless there were symptoms which showed that the lesion involved more than the thalamus. The hemiplegia, in these cases, if it persisted, as it usually did, to some extent, was not accompanied eventually by any increase in reflexes or signs of involvement of the motor tract. I found, in none of them, any choreic or athetoid movements, and it seems to me that these post-hemiplegic movements are in all cases, whatever their source, more commonly developed in children and not in adults.

About the time that I was studying these cases Roussy published a very elaborate monograph on the optic thalamus and the thalamic syndrome. His work contains a very complete and admirable historical introduction. It contains the records of experiments on animals which, it seems to me, are not convincing, and are certainly far less valuable than those which have been made and are now being made by Dr. Ernest Sachs. His clinical studies and pathologic work are, however, very carefully done, and he reaches the conclusion that the thalamic syndrome, which merits to-day a place in our nosology, is characterized by, first, a slight, persistent hemianesthesia, more or less marked for superficial sensation, and, second, by a slight hemiplegia, usually without contracture, and rapidly regressive; third, by a hemiataxia, which is slight, and an astereognosis, more or less complete; fourth, by sharp pains on the hemiplegic side, which are persistent, paroxysmal, often intolerable, and not yielding to any treatment, and, fifth, by certain choreic and athetoid movements in the limbs of the paralyzed side.

Aside from the purely thalamic syndrome, we often have, as already stated, lesions which involve the thalamus and the parts adjacent, so that usually the thalamic syndrome is complicated by the symptoms of these adjacent parts. If the lesion extends well forward, we have a permanent hemiplegia, with contractures. If it is more posterior, we have hemianopsia, involvement of the ocular muscles, pupillary reflexes and forced movements.

It will be seen that the cases which I have studied tend to confirm, in a general way, the elaborate studies of Roussy. We have both, apparently, independently reached the conclusion that the old idea of the thalamus being an organ which controlled the movements of emotional expression was incorrect. It seems unlikely, also, that pure lesions of the thalamus lead to any such disturbances of emotional expression as are seen in forced laughter and forced crying. Still, I believe that thalamic lesions which extend into other areas and involve some of the associated tracts and higher reflexes do produce these phenomena.

FUNCTIONS

It would be premature in me now to discuss the extremely interesting question of the anatomic connections and functions of the thalamus. Work on this line is being carried on by Dr. Ernest Sachs with the very ingenious instruments devised by Sir Victor Horsley and Dr. R. H. Clark. The tendency of the investigations of Sachs, as well as those of Roussy, and of the comparative anatomic studies of Edinger, is to show that the thalamus is essentially only an organ for the reception and distribution to the cortex of sensory impressions, that it forms a part of the primary sensory centers for vision, hearing, smell, equilibrium and deep and superficial sensibility.

One stands almost aghast at the enormous inflow of sensory impulses which this small body must be continually receiving and distributing. The spinothalamic fibers bring up sensations from the columns of Goll and Burdach, and the anterior peduncles of the cerebellum pour its equilibrating outflow from cerebellar cortex and dentate nucleus into the thalamus. The pulvinar receives some of the primary visual sensations, and there are centers which receive impulses from the auditory and olfactory nerves. This sensory inflow is distributed to the various regions of the cortex connected with the sense of vision, hearing and smell and muscular and cutaneous sensibility. Dr. E. Sachs has shown that tracts from the thalamus pass up to the precentral convolutions, there being special fibers for the face, arm, trunk and leg centers.

The thalamus, therefore, seems really to have about the function which Meynert assigned to it thirty years ago, when he said that it was an organ which received sensations and registered them in consciousness. There is still some dispute as to whether it has efferent tracts to the cranial and spinal motor nerves, acting in this way as a reflex center of a high order. It does, however, send efferent fibers to the longitudinal bundle. There is also some question as to whether there are fibers from the cortex to the thalamus. The question whether the thalamus has centers for vasomotor and thermic regulation or for the visual organs is still unsettled. At present all we can say is that it is an enormous primary sensory nodule,

acting to receive and to distribute sensory impulses probably of all kinds, but just as it is not all of the primary visual centers or of the primary auditory centers so it seems to me likely that it is not the whole of the primary center for the sensations that are poured in from the spinal cord and cerebellum.

Therefore, there would come from its injury always some sensory disturbances, such as anesthesias, ataxias, astereognosis, pains, and disturbances of vision and of the ocular movements, but these would not be complete in any direction.

In conclusion, we may accept it as a fact that there is a pretty definite thalamic syndrome which has been given above and ought to enable us to recognize thalamic lesions and thalamic lesions associated with injury to neighboring parts. This syndrome may be made much more definite and modified by subsequent investigations. It may be found, for example, that some ocular reflex disturbances always occur; the character of the sensory disturbances need careful study; also the changes in the vasomotor innervation and temperature; indirectly, through involvement of the thalamus, there may be some psychical disturbances, and in large lesions forced laughter and crying may be present. The syndrome varies somewhat according to the location of the lesion. The thalamus has a vascular supply from three different sources, and the organ can not be easily destroyed altogether by one vascular lesion.[1]

CASE 1.—*Focal Hemorrhage in the Optic Thalamus.—History.*—Charles C., aged 56, colored, born in the United States, occupation, porter, was admitted to Bellevue Hospital on December 26. His father died at the age of 60, of unknown cause, and his mother at childbirth; his two brothers were living and well. The family history was unimportant, there being in it no history of rheumatism or arterial disease or alcoholism. The patient was married and had two children. He suffered from the ordinary children's diseases, and had rheumatism about five years before admission. He had had no previous attack like the present. He was moderate in his habits—in his use of tobacco and beer. There was no specific history, or evidence of syphilis about him.

Present Illness.—The patient's story was that at about 11 a. m. on the day of admission, while at his ordinary work, and feeling as well as usual, he suddenly felt a severe headache, with sickness of the stomach and vertigo. He had to stop work, and an ambulance was called which brought him to the hospital.

Examination.—When admitted he was in a semicomatose state, with a very complete paralysis of the left side, so that he could not move either arm or leg; there was also a lower facial paralysis, the tongue protruding to the left. In general appearance he was fairly well nourished, mucous membranes normal, tongue white and coated. There was a systolic apex murmur over the heart; the pulse was slow (50 per minute), regular and strong, of moderate volume, and not very high tension. The arteries were much thickened and had calcareous deposits. The temperature was subnormal, 97.4 F., in rectum. respirations 28, and there were a few mucous râles in the lungs. The abdominal organs were normal; skin moist. An examination of the urine, made the next day, and on several subsequent days, showed a specific gravity ranging from 1020 to 1025, a trace of albumin, no sugar, hyaline and granular casts during the first week, but no casts after that time. The eyes showed a pronounced arcus senilis; the pupils were unequal, left large, the right small, the left reacted to light slightly, the right not at all to light or accommodation. The paralysis of the left side was complete, as stated, involving the lower part of the face, hand and leg. Both knee-jerks were exaggerated, the left more than the right; there was no clonus or Babinski reflex. There was a slight degree of anesthesia on the left side; no hemianopsia. The patient was able to swallow and his speech was normal, except that it was indistinct, owing to the clouded mental condition. He had incontinence of urine but not of the bowels. He was too stupid to exhibit any emotional disturbances.

Course of Disease.—He vomited once about an hour after admission. He passed a quiet night, took nourishment very well, and appeared much brighter in the morning. His incontinence of urine continued the next day, so that he had to be catheterized. This incontinence continued for the succeeding week. The next day his paralysis had nearly disappeared. He could move the arm and leg, in one or two days he was able to sit up and in four or five days he walked about the wards. At the end of about a week, however, he complained of weakness and grew more dull, went to bed and did not get out of it again. He continued in bed, growing more apathetic, though restless at times, and acted in a childish and irrational manner, talking continually, trying to get out of bed, so that some of the time his feet and shoulders had to be restrained. He would move his arms about restlessly, pulling at the bedclothes and trying to pull over the table near him or to stretch out and reach the patient in the neighboring bed. Still he was able to answer ordinary questions and to talk with his children, who came to see him in the first week of his stay. At the end of ten days he developed at times incontinence of feces as well as of the bladder. The changes in the pupils disappeared, as did also most of the anesthesia and all of the exaggeration of the reflexes. At no time was it possible to get an ankle-clonus or a Babinski on the left side. At the end of the third week the patient was unable to swallow nourishment and medication, and became very weak. He at no time seemed to suffer from any disorder of the special senses, his eyesight and hearing being apparently normal. His temperature, after the initial fall, gradually rose, so that on the seventh day and again on the eleventh day it was 101. It ranged during the course of his illness about 99½. The last day of his illness it rose to 102½ in the rectum. The pulse, which was at first about 50, gradually increased until, on the fifth day, it was 60, and on the seventh day 80. It then gradually increased until it ranged about 100; respirations ranged about 26 throughout the course of the disease. He had an average of one stool a day; the urinal amounts were small, ranging from 10 to 20 ounces per day, though at times some was lost with the stools. He finally developed a hypostatic pneumonia and died on January 16, three weeks after the onset of the disease.

Autopsy.—The postmortem, made by Dr. Fiournoy, showed a slight amount of tuberculosis of the apex of the lungs, and beginning apex pneumonia, on the right side; a thickening and hardening at the base of the aortic valves, and a thickening of both mitral valves, with hypertrophy of the left ventricular wall; marked atheromatous changes in the aorta, both in its thoracic and abdominal portions; very general arteriosclerosis; spleen, liver, suprarenals, and abdominal viscera normal; a chronic interstitial nephritis. The brain showed marked atheroma of the vessels at the base. The dura was not adherent. No edema was noted. The only gross lesion of the brain was a hemorrhage about 2 by 1 cm. in size, in the inner and anterior portion of the right optic thalamus, and confined to the optic thalamus, but pressing very manifestly on the internal capsule behind the germ. The posterior portion or pulvinar of the thalamus was not involved, and as this is the part which is supplied by the posterior cerebral, it is to be inferred that the vessel which was ruptured was one of the small branches of the opticostriate artery, which comes from the middle cerebral.

The localizing symptoms in this case are explained by the findings. The hemiplegia was undoubtedly due simply to pressure. The patient's mental condition was very dull, and he was inclined to sleep a great deal—a phenomenon which has been observed in thalamus lesions.

1. Hemorrhages in the thalamus may come from (1) the lenticulo-optic arteries; (2) the postero-internal optic (a branch from the posterior communicating); (3) the anterior choroidal arteries; (4) a branch of the posterior cerebral, which sends also branches to the geniculate bodies and their surrounding parts. Also the arteries of the corpora quadrigemina send small branches to the thalamus. On account of this varied supply of small arteries, hemorrhages of the thalamus are smaller than those of the corpus striatum. The lenticulo-optic and the branch from the posterior communicating cause hemorrhages in the anterior and posterior parts respectively. Those in the posterior part are certainly rare. It is these which destroy the pulvinar and often neighboring parts, and cause central pain, hemianesthesia and hemianopsia.

There was an unusual disturbance of temperature at the beginning; it could not be inferred that the lesion here had any effect on what fever the patient had later. There were no convulsive choreic movements and no evidence of pain, either central or peripheral. The patient's clouded mental condition was one that could hardly be explained by the very circumscribed lesion. The paralysis of the bladder came on early and continued to be present, despite the disappearance of the hemiplegia. One could not certainly, however, exclude the mental condition as the causative agent in producing the bladder incontinence. There were no trophic disturbances of the body and no marked vasomotor disturbances. Whether the patient had any paralysis of the emotional movements of face, I regret to say, could not be determined. They certainly were not noticeable when the examination was first made. At that time the facial paralysis was similar to that found in ordinary hemiplegia, involving the internal capsule.

The localizing symptoms were a flaccid sensory-motor hemiplegia, the motor symptoms rapidly disappearing, leaving only sensory symptoms; the absence of exaggerated reflexes; pupillary symptoms.

The absence of central pain was, no doubt, due to the fact that the posterior portion of the thalamus was not involved, the central pain probably only occurring when the branch of the posterior cerebral, which supplies this part, is affected.

The theory that choreic and asthetoid movements are produced by lesions of the thalamus, which irritate the fibers of the internal capsule, would seem to be somewhat weakened by the facts of this case, so far as they go, for here was a lesion which unmistakably pressed directly on and lay close to the motor and sensory tract of the capsule.

The mental condition was not unlike that seen in terminal apoplectic states and might be largely due to the pressure and irritation of the lesion at first; later to toxemia and secondary degenerative changes in the brain, the result of the arterial sclerosis.

CASE 2.—*History.*—Henry H., aged 64, mason, was brought to the hospital with the history of having suddenly fallen from a chair, and found to be partially paralyzed on the left side. His previous history was little known, except that he had been a hard drinker. It was not until about three weeks after this attack that he was brought to Bellevue Hospital, where he was admitted on February 21.

Examination.—He was then much emaciated, with brown, dry tongue, rectal temperature 97.6, regular but feeble heart action, no murmurs. The thoracic and abdominal organs were apparently normal, except that the liver was quite small. There was no albuminuria. There was a partial paralysis of the left side, the leg being held rather stiffly, but the tendon-reflexes were absent and there was no clonus. There was some loss of cutaneous sensation on this left side. The pupils were equal, but did not react to light or accommodation. The neck was somewhat stiff. The patient was in a semidelirious state, but slept the greater part of the time. There was incontinence of bladder and bowels. The arteries were very incompressible and atheromatous.

Course of Disease.—The patient continued in about the same condition of semicoma, with a muttering delirium, but without any fever, temperature ranging from 97.4 to 98. He finally developed pulmonary edema and died two weeks after his admission and about two months after the onset of his disease.

Autopsy.—The lungs were emphysematous; the heart was hypertrophied, with some rigidity of the valves. There was atheroma of the aorta. The liver was cirrhotic. The kidneys showed some amount of cirrhosis and parenchymatous degeneration, though there had been no albumin in the urine. The brain showed a good deal of serous effusion under the pia and in the subarachnoid space. There was an old hemorrhage, which had occurred six weeks before in the thalamus, and also quite a fresh one, which lay to the outer side of the first. The first was confined to the thalamus, the second extended into adjacent parts.

In this case the localizing symptoms were masked by the confused mental condition.

There was the rather remarkable persistence of low temperature, and the rigid pupils, the sensori-motor hemiplegia without exaggerated reflexes, were suggestive. The muttering delirium and the mental cloudiness and somnolence are best explained by the general condition of arterial sclerosis and the so-called "serous meningitis" or serous effusion which were present. He had had no alcohol for two months. The loss of reflex to light and accommodation in the pupils and absence of deep reflexes were symptoms found also in the previous case.

CASE 3.—*History.*—Christina T., aged 53, Italian, personal history unknown, two weeks before admission to the hospital, was going downstairs, and when near the bottom suddenly fell forward on the floor. She was picked up unconscious and remained so for about an hour. Then she became restless and delirious, and it was noticed that she had a left hemiplegia. She was brought to the hospital two weeks later.

Examination.—When admitted the patient was in a mildly delirious condition. There was a considerable degree of paralysis of the left arm and leg, but very little in the face. There was a cutaneous anesthesia of the left side, and the reflex of the knee on the left side was absent. The thoracic and abdominal organs were normal, except that the urine showed a small amount of albumin and casts.

Course of Disease.—On the succeeding days the patient became more quiet and finally quite rational. She slept most of the time. Pupils were evenly contracted, but responded to light. The paralysis gradually improved. After about ten days she began to relapse into a comatose condition, with stertorous respiration, and four days later the coma deepened, the pulse became slow, and she died.

Autopsy.—There was found a large recent clot in the optic thalamus, on the right side. The ventricular fluid was not in any excess, but was slightly stained with blood; the clot, however, had not burst into the ventricle. The kidneys showed a chronic fibrous nephritis.

CASE 4.—*History.*—The patient, a man, aged 34, was taken to the alcoholic wards of Bellevue Hospital, suffering from delirium tremens. He presented the usual symptoms of motor and mental excitement, with hallucinations. Nothing was known of the previous history. His temperature on admission was 105.4. The next day it was 105.8, and he died on the second day. During his stay in the ward he showed no evidences of any paralysis or any disturbance of nervous centers, aside from the excitement and delirium.

Autopsy.—The brain in this case showed the usual degree of congestion. There was no exudation and not much edema. On cutting the brain open a small hemorrhage was found in the middle part of the posterior third of the right optic thalamus. It measured 1 by 0.75 cm. and was about the size of a small bean. Another small hemorrhage was seen on the descending horn of the right lateral ventricle. The other organs were practically normal.

The history in Case 3 simply shows a temporary hemiplegia with residual anesthesia and absent reflex. This, so far as it goes is characteristic of the thalamic syndrome. The fourth case shows simply that a small thalamic lesion may be present and cause no severe symptoms.

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ABSTRACT OF DISCUSSION

DR. HUGH T. PATRICK, Chicago: In these thalamic lesions are the pain and anesthesia pretty well defined as to localization, that is, not quite hemiplegic, but perhaps affecting only the foot, hand or face? This point might be noted in connec-

tion with my own paper, because one of the patients whom I did not inject was sent to me by a physician who assured her that I would relieve the pain. She complained of pain particularly in the upper part of the face, not limited to the supraorbital distribution; it was not pain of trifacial neuralgia, but it was exceedingly distressing and was a constant pain which was just wearing this old lady out. She had the other symptoms of thalamic lesion; that is, she had had a stroke of hemiplegia from which she had practically recovered and still had the anesthesia. There was a little clumsiness on the one side, but practically no loss of power.

DR. H. A. TOMLINSON, St. Peter, Minn.: I have the records of three cases of unusually high temperature persisting until death, in which, postmortem, I found a spot of softening on the ventricular surface of the optic thalamus just to the outside of the pulvinar. In these cases the temperature had ranged from 105 to 107 F. for several days before death.

DR. JULIUS GRINKER, Chicago: In the cases of hemiplegia which are followed by pain, of the kind described, are we to infer that the lesion is always in the optic thalamus?

DR. C. L. DANA: In Dr. Patrick's case the pain was a central one, but in the cases I have seen the pain has been in the arm and foot mainly, not all over the body necessarily, but in one case I remember the patient who was rather hemiplegic still had terrible pain in the foot and leg. In another patient it was mainly in the arm; and I can conceive that the lesion might be such as to cause pain mainly in the face.

I doubt if one can get any central pain from a brain lesion alone except from a lesion of the thalamus. I do not think there can be pain from the irritation of the sensory tract behind it unless it be perhaps in the bulb. The real serious pain at least seems to be always a thalamic pain.

TRANSMISSION OF MALARIAL FEVER IN THE CANAL ZONE BY ANOPHELES MOSQUITOES *

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ANCON, CANAL ZONE

It is between eleven and twelve years since Ronald Ross conducted his famous experiments demonstrating the transmission of malarial fever by mosquitoes. This demonstration, it seems to me, has contributed more to the forging of the key to the control of the tropics than any other one in the annals of tropical medicine, for Ross' discovery focused the attention of the medical world on the part played by suctorial invertebrates in the transmission of infectious diseases. Knowledge of this doctrine of the insect intermediary host, coupled with Dr. H. R. Carter's invaluable observation of the extrinsic period of incubation, enabled the yellow fever commission to verify Finlay's notion about the transmission of yellow fever by stegomyia mosquitoes.

The application of these two discoveries, Ross' and Reed's, to the problems of preventive medicine by your President-elect has made yellow fever a historic disease in Panama and is surely reducing the morbidity and mortality from malarial fever to the vanishing-point.

The object of the work briefly reported here was to go over the whole subject of the transmission of malarial fever by anopheles mosquitoes. I have been guided by the work of Ronald Ross, Stephens, Christophers and James, whose investigations of malaria in India and Africa must stand as models for all future workers on this subject. In every malarial region it is a matter of importance to determine the varieties of anopheles in that region, their bionomics, the species hospitable to malaria and those which can not transmit it. The English investigators, James, Christophers and Stevens, observed that different species of anopheles had different degrees of susceptibility to malaria; certain species were natural transmitters of malarial fever, while others were rarely, if ever, found infected naturally, although it would be possible to infect them under laboratory conditions. It is important, then, to determine what varieties of anopheles are present and which ones may act as the intermediary hosts in the transmission of malarial fever; this is particularly true when the malaria-transmitting anopheles have different breeding habits from those which are not responsible for the spread of malarial fever. Various observers have published notes on the breeding habits of anopheles. It may be said that there is as much selection of breeding-places by anopheles as there is selection of feeding-grounds by fish. Trout, salmon and bullheads have their analogues among anopheles larvæ, some requiring fresh aerated water, or water containing much green algæ; others select tree-holes and the recesses of epiphytic tree-plants, such as bromelias, as breeding-places; while others preferring fresh aerated water are so adaptable that they will breed in brackish water, containing half its volume of sea-water; some species require plenty of sunlight, while other sylvan species prefer shady pools in which chlorophyl-bearing algæ are relatively absent.

The identification of mosquitoes used in these experiments has been corrected or verified by Mr. A. H. Jennings, and his identifications are being checked in the Bureau of Entomology, U. S. Department of Agriculture, Washington.[1]

Notes on the species of anophelines in the Canal Zone, their relative numbers and breeding habits, were published by Mr. August Busck of the U. S. Bureau of Entomology in May, 1908. Eleven species of anophelines have been collected in the Canal Zone. Of these eleven species the three commonest ones are *A. albimanus, A. pseudopunctipennis* and *A. malefactor. A. albimanus* is much the commonest anopheles in the Canal Zone and is the one oftenest taken in quarters and barracks, although the proportion of one species to another varies somewhat with the season and locality. In certain villages only *A. albimanus* is taken in barracks, while in other villages from 5 to 10 per cent. will be *A. pseudopunctipennis*, and at Ancon during October, 1908, 27.5 per cent. were *A. malefactor* and 72.5 per cent. were *A. albimanus*. Tree-breeding species are rarely encountered and I know of no instance in which specimens of this species have been taken in quarters. The female anopheles visits quarters to obtain blood, which is necessary for the development of her ova. When specimens of *A. albimanus* (males and females), placed in a large comfortable breeding-jar with sufficient vegetable food, such as dates and bananas, were permitted to pair, the ovaries of the females showed no development within fifteen days.

The experiments were begun in October, 1908, during the rainy season and discontinued in February, 1909, during the dry season. Mosquito larvæ were collected by sanitary inspectors at various places in the Canal Zone. On being received at the laboratory, larvæ and algæ were placed in moist jars on a table in front of a window with an eastern exposure so that they got direct sunlight for an hour or two in the morning. Predaceous larvæ were killed and removed from the breeding-tanks. A preliminary difficulty was experienced in

* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.

1. Dr. H. G. Dyer has since verified all our identifications save one rubbed specimen which is probably *A. apicimacula*.

the gradual fouling the water of the tank; this was obviated in a very simple way by passing air bubbles through the water with a Paquelin cautery bulb. In this way the water was kept fresh and the larvæ remained vigorous. After the larvæ had pupated they were placed in breeding-out tubes plugged with cotton, and after twenty-four or forty-eight hours the newly emerged mosquitoes were transferred to jars made of lantern chimneys, covered with crinoline gauze, where they might pair and be kept for biting. Females would bite twenty-four to forty-eight hours after emerging; frequently on successive and always on alternate nights for a period of at least fifteen days. The species of anopheles used were *A. albimanus, A. pseudopunctipennis, A. franciscanus, A. argyritarsis, A. malefactor* and *A. apicimacula.* These mosquitoes fall into three groups: the white hind-footed group; the uniformly colored group; and the spotted-legged group.

A series of bitings were conducted on suitable infected patients who were carrying estivoautumnal or tertian gametes in their peripheral blood, using four varieties of mosquitoes. Out of several hundred mosquitoes used in the biting experiments, 100 mosquitoes were dissected, and of these 70.8 per cent. of *A. albimanus* became infected; 12.9 per cent. of *A. pseudopunctipennis* became infected, and none of *A. malefactor* (17 mosquitoes used) became infected, although several of the latter were purposely placed in jars with *A. albimanus* and bit at the same time persons from whom the specimens of *A. albimanus* became infected.

It is concluded from this series of biting experiments that *A. albimanus,* the common white hind-footed mosquito—an extremely hardy, vigorous, rapidly developing, adaptable mosquito—is the transmitter of estivoautumnal and of tertian malarial fever in the Canal Zone at this time. Specimens of this species infected with tertian parasites became infective between nine and eleven and a half days after the first feeding. When infected by estivoautumnal parasites, sporozoites appeared in the salivary glands as early as the eleventh day in some mosquitoes and later than twelve and a half days in others. *A. malefactor* is not concerned in the transmission of malarial fever in the Canal Zone at this time. *A. pseudopunctipennis* is only slightly concerned in the transmission of malarial fever; this appears not only from the fact that only four out of thirty-one mosquitoes under the most favorable artificial conditions became infected, but from the additional fact that relatively few specimens are taken in quarters at the present time.

The English investigators appear to have made no attempt to determine the limits of infectiousness of man in malarial fever. To me this appeared to be, if possible, worth determining, because in the discharge of patients from the hospital it would be manifestly unwise to turn a patient out, although free from symptoms, yet with gametes enough in his peripheral blood to infect every susceptible anopheles mosquito that might bite him. Efforts to determine the limit of infectiousness of man were made in the following way:

In the 47 biting experiments, several blood preparations were taken fresh and for staining, at the time of the biting. Differential counts of leucocytes and the ratio between crescents and leucocytes were determined the next morning. Leucocyte counts were occasionally made at the time the blood was taken so as to check this method of estimating the crescents. In this way it was always known how many crescents were in the peripheral blood per c.mm. at the time the mosquito was infected. The next step was to weigh a number of mosquitoes before and after biting in order to estimate the amount of blood retained by a mosquito. In this way the approximate number of gametes ingested could be calculated. Again, smears were made from the midgut of mosquitoes that had a few minutes before bitten a person whose blood contained numerous gametes. From this it was found that about one-half the gametes were phagocyted by polymorphonuclear leucocytes and thus destroyed. Finally, mosquitoes which had fed but once on patients whose crescents per leucocytes had been estimated were fed subsequently on dates, and on dissection of these mosquitoes the probable limit of infectiousness was determined as being near one gamete per 500 leucocytes. From these observations, I am confident that a patient with more than one crescent for every 500 leucocytes, or 12 crescents per c.mm., is infective, and it follows that such an individual should not be discharged from treatment in that condition or should be warned or required to continue treatment. Such a person is a gamete-carrier and is a menace to a malarial community whenever susceptible anopheles have access to him.

The effect of quinin administration on the number of gametes in the peripheral blood was studied in a number of patients suffering from estivoautumnal and tertian fever by the administration of 30 grains quinin daily, either with or without iron and arsenic, and by withholding quinin and merely requiring rest from labor. In estivoautumnal infections, when there were crescents in the blood, the number was reduced by quinin, 30 grains daily, at the following rates. For example, in Experiment 17 there were:

9	crescents per 100 leucocytes	on December	26
5	crescents per 100 leucocytes	on December	27
5	crescents per 100 leucocytes	on December	28
4	crescents per 100 leucocytes	on December	30
1	crescent per 100 leucocytes	on December	31
0	crescents per 100 leucocytes	on January	2
0	crescents per 100 leucocytes	on January	13

In Experiment 20 the crescents were reduced from 67 per 100 leucocytes to one per 200 leucocytes in twenty-five days.

In Experiment 41 crescents were reduced from 92 per 100 leucocytes to one per 100 leucocytes in fifteen days; while, on the other hand, in Experiment 6, when quinin was withheld, crescents remained constantly in the peripheral blood for twenty-three days, there being 16 crescents per 100 leucocytes on admission and 20 crescents per 100 leucocytes at the end of the period.

From this it is concluded that generous daily doses of quinin, grains 10 t. i. d., will reduce the sexual forms of the estivoautumnal parasite to a non-infectious minimum in from a few days to two or three weeks, depending on the severity of the infection.

In tertian malarial fever there is never an abundance of gametes in the peripheral blood after the disappearance of the asexual forms such as is seen in estivoautumnal infections; besides, all forms of the tertian parasite disappear from the peripheral blood within two or three days under quinin treatment and occasionally disappear when quinin is withheld.

A curious relation was observed between the average number of days that gametes remained in the blood in estivoautumnal and tertian infections when under quinin treatment, the number being about ten in estivoautumnal and three in tertian, and the average proportion of the incidence of estivoautumnal to tertian malarial fever in the Canal Zone. This might be interpreted

as indicating that the proportion of cases of estivo-autumnal to tertian malaria depends on the number of days that gametes are in the peripheral blood in numbers sufficient to infect *A. albimanus,* which is the host for both forms of the parasite.

The infection of *A. albimanus* and the development of malarial parasites in her midgut is not interfered with by quinin when such an infected mosquito feeds daily or on alternate days for fifteen days on patients who are receiving 30 grains of quinin in solution daily. In these instances the zygotes mature and sporozoites reach the salivary glands in the usual period.

Observations on latent malaria were made during the past dry season in several villages where the malarial sick-rate did not fall to zero and where no anopheles were breeding. On a systematic blood examination of laborers and their families, I found that 10 per cent. of men who were at work without symptoms had parasites. Three per cent. of the cases of latent malaria were of the estivoautumnal variety and 7 per cent. of the tertian variety. Among the families of Spanish and West Indian laborers the amount of latent malaria was 30 per cent. A few cases of fever would arise from this source every week, probably following some loss of resistance caused by dissipation, wetting or overheating. It is this latent malaria in every tropical community which contributes largely to the preservation of the malarial parasite and to the infection of anopheles when, after the onset of the rainy season, mosquitoes have begun to breed in numbers.

The theories of Mannaberg and Craig explain the persistence of latent malaria by the process of conjugation of two ring forms within a red blood corpuscle. During examinations of the blood, in cases of latent malaria, I have frequently seen estivoautumnal crescents which had apparently been formed by the fusion or conjugation of two ring forms, or of two pigmented forms, but I have also very frequently seen in estivo-autumnal and tertian malaria red blood cells infected by two or more ring forms which have gone on to maturity without conjugation. Sometimes these contiguous parasites were of the same age, but oftener one would be a little older.

Quinin administered in latent malaria appears to destroy the ring forms only and prevents the possibility of their development into gametes. The gametes in the blood stream are probably phagocyted by splenic and hepatic endothelial cells and are not influenced by quinin directly.

The points I wish to emphasize are these:

A. albimanus, the common white hind-footed anopheles, is the host for estivoautumnal and tertian malarial parasites in the Canal Zone at this time.

A. malefactor, notwithstanding its name, does not transmit malarial fever.

A. pseudopunctipennis is only slightly concerned in the transmission of malarial fever.

In the efforts at mosquito destruction, the extermination of *A. albimanus* is of paramount importance.[2]

Patients having crescents or tertian gametes in their peripheral blood should not be discharged from the hospital, nor should treatment be discontinued until gametes have been reduced to a non-infectious minimum. The destruction and prevention of development of the sexual parasites in man is of great importance and may be accomplished (1) by appropriate quinin treatment of all gamete-carriers entering the hospital; (2) by occasional quinin treatment to destroy latent malaria; (3) by the periodical blood examination of laborers in quarters where there is a high malarial rate for the detection of gamete-carriers and latent malaria in order to carry out appropriate treatment.

Thirty grains of quinin sulphate in solution daily is an efficient dose for the purpose required.

Ancon Hospital.

2. I have since determined that *A. tarsimaculata* also transmits estivoautumnal parasites. This mosquito belongs to the white-hind-footed group and has recently been breeding in rather large numbers in brackish water near Colon.

ABSTRACT OF DISCUSSION

DR. JOHN A. WITHERSPOON, Nashville, Tenn.: We all know now that the malarial parasite is really carried by the mosquito. I have been especially interested in the attacks made on the anopheles in the Canal Zone and the special methods used. It seems to me that the great work in the Canal Zone, especially in carrying out the discoveries of Ross, means much for the future, not only for the preservation of life of the people, but for the natural resources of the country. It solves the problem of what to do with the products of that country; it solves the problem of how the Canal Zone can be peopled. Nothing could be accomplished without these important discoveries. I think the people owe a debt of gratitude not only to Colonel Gorgas, but to men like Dr. Darling and others who are working there every day. The excellent work that is being done in the Ancon hospital is a credit to any country; the work done in the Canal Zone is a credit to the nation.

DR. SEALE HARRIS, Mobile, Ala.: It seems to me that we should apply the lessons learned in the Canal Zone to our own country. The majority of us who treat malaria cease giving quinin after the patient has been relieved of his fever. In order to prevent other mosquitoes becoming infected, I think it would be well to continue the use of quinin for a considerable length of time. Note the antimalarial work that has been done in Italy in the last five years; the death-rate there from malaria has been reduced two-thirds by this crusade, which was carried on with the idea of preventing the mosquito becoming infected. After the patients were free of fever for some days, after a sufficient dose of quinin had been given to relieve the paroxysms, quinin is given in small doses, 6 grains a day, for a period of at least three months. It seems to me that in the treatment of malaria we should use exactly the same methods to prevent others from becoming infected, as with patients afflicted with yellow fever. Malaria and yellow fever are diseases, so far as their transmission is concerned, of much the same character. Both are transmitted by the mosquito. If we use the same measures in malaria as are used in Italy, I think we can reduce the number of cases of malaria very materially. In handling a patient with malaria, the first thing to do is immediately to isolate him by placing him under mosquito bar, or in a house where the mosquitoes cannot gain entrance. Individuals who have been exposed should receive prophylactic doses of quinin. The medical profession should begin an active crusade against malaria in this country. It means a great deal to us. When we consider that the number of deaths from malaria is probably 15,000 per annum and that several millions of people in the United States are affected by that disease, we realize the importance of the disease and we should at once institute a crusade against it. I am sure that such a crusade, carried out as it has been in Italy, will give results as good as have been obtained there.

Collections of Medical Books.—Our German exchanges comment with envious approval on the fine medical library of the College of Physicians in Philadelphia, with its 100,000 volumes, most of which are said to be the gifts of members. The *Münchener medizinische Wochenschrift* exclaims: "How much we can learn from our American cousins! With a few exceptions, which we gratefully appreciate, the books left by German physicians on their decease find their way to the second-hand bookstores to which they are sold for a song and the collection is dispersed, while if they were bequeathed to some medical library they would keep their former owner's memory in honor while benefiting the profession at large."

THE VALUE OF ALIMENTARY LEVULOSURIA IN THE DIAGNOSIS OF HEPATIC CIRRHOSIS *

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Any condition bringing about macroscopic or microscopic changes in an organ must of a necessity be accompanied by disorders of the normal function of that organ. On the other hand, there are some functional disturbances of the body and its organs, collectively and individually, which so far as we know are unaccompanied by any microscopic or macroscopic alterations of structure. Investigators interested in this particular field are devoting more and more attention to the functional consequence of organic disease. We are not content now simply to make a clinical diagnosis of a condition, but we demand to know what physiologic change is brought about by the morbid process we are studying. When it is recalled to what extent the literature has been enriched by the reports of investigators, in regard to testing the function of various organs, the publications pertaining to methods for determining disturbed hepatic function seem insignificant. The nervous and cardiovascular systems have been systematically studied; the lungs have received some attention; the stomach, the intestines and the kidneys are claiming their quota of experimental and clinical work, and functional tests for all are described, confirmed and constantly used by the foremost clinicians. Yet, despite the inestimable advantages which we have derived from some of these tests, we seem to know of none we can call to our assistance to aid us in diagnosing cases of functional disturbances of the liver.

Investigators there have been who claimed to have found clinical tests for such conditions, but one by one these have fallen into oblivion for want of confirmation. The following may be cited as illustrations:

The toxicity of the urine was thought by Bouchard[1] to be an indication of hepatic insufficiency. Schapiro,[2] in studying the question of prognosis in liver cirrhosis, stated that he found a more rapid output of strychnin, given in medicinal doses, in liver cirrhosis than normally. He also states that he found glycosuria followed 200 to 250 gm. of sugar given in the form of fruit preserves to cirrhotics, a fact which he did not properly interpret, and to which I shall refer again. Schwarz[3] eight years later, made some experiments based on Minkowski's observations that after liver extirpation lactic acid appeared in the urine. He gave 15 gm. sodium-lactate and determined the time of the appearance and the amount of lactic acid. Schwarz found that cirrohsis and functional disturbances did not affect the output, but that the lactic acid appeared later than normally, and concludes that it may be explained on mechanical rather than on chemical grounds.

The most marked advance on our knowledge of the subject we owe to Strauss,[4] who approached the question from three points of view:

1. Detoxicating process.
2. Protein metabolism.
3. Carbohydrate metabolism.

1. *Detoxicating Process.*—He observed an increase of fatty acids in the urine of cirrhotic patients. Munk some time before had found that the toxicity of a soap solution was two and one-half to three times as great when it was injected into the great body veins as it would be if it were injected into the portal veins, owing to the detoxicating action of the liver. Based on this report, Strauss gave 20 gm. sodium butyrate in 8 cases: 5 cirrhosis, 2 carcinoma and 1 chronic obstruction of the common duct. In 6 cases he found increase of fatty acids, in 1 of carcimona and in 1 of obstruction, no increase; but he lays no importance on this, as the same was observed in fever, lead-poisoning and diabetes. He regards the test as valueless.

2. *Protein Metabolism.*—With protein metabolism he had no definite results, and he believes that the study of the relation of urea to total nitrogen is worthless as a test.

3. *Carbohydrate Metabolism.*—This part of his study was based on the research of Sachs,[5] who, working under Strauss' direction, found that in frogs, after extirpation of the liver, there was a lessened tolerance for levulose, but not for dextrose, galactose and arabinose. Sachs made some clinical experiments and found that healthy individuals, as well as diabetics, stood levulose better than dextrose, whereas in liver diseases the tolerance to the same amount of levulose was very much diminished. In a later paper Sachs[6] showed that only the liver was able to form glycogen from levulose, the muscles having no such property, so that it was fair to assume that alteration in hepatic function would be expressed in a diminished tolerance for levulose.

Strauss followed up this very broad hint in 87 cases, 58 of the subjects being healthy as to their liver, clinically, and 29 hepatic cases. Of the latter, 26, or 90 per cent., showed levulosuria, while of the healthy subjects 6 showed levulosuria, giving a percentage of 10. Strauss thinks that this 10 per cent. error—one might call it—may possibly be no error, as there was no way of knowing, apart from clinical study, whether there was any latent disease of the liver or not. In fact, 2 subjects were drunkards, and suffering from obesity and gout; 1 had pneumonia (Rosenberger[7] found levulosuria to occur quite frequently in this condition) showed chronic fever, 1 anemia from gastric hemorrhage, and 1 had some hepatic congestion secondary to mitral stenosis.

In the cases of liver disease not showing levulosuria 1 was atrophic cirrhosis with severe diarrhea interfering with absorption of levulose; the second was acute cholecystitis of two days' duration; and the third was a cyst of the liver.

Furthermore, Strauss found two cases of diabetes showing levulosuria, which is remarkable, as ordinarily diabetics excreted more dextrose after levulose ingestion.

Unlike most observers advancing a new idea, Strauss says that not too much weight should be placed on the test alone, but that a final diagnosis should be made only after careful weighing of the data derived from clinical and laboratory examinations. He made eight observations with 150 gm. cane-sugar and found once glycosuria, four times levulosuria, once saccharosuria and two negative.

* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.

* From the private laboratory of Dr. John H. Musser.

1. Bouchard: Quoted by Strauss, Deutsch. med. Wchnschr., 1901, pp. 757 and 786.
2. Schapiro: St. Petersburg. med. Wchnschr., 1891, p. 241.
3. Schwarz: Wien. med. Wchnschr., 1899, p. 1754.
4. Strauss: Deutsch. med. Wchnschr., 1901, p. 757.
5. Sachs: Ztschr. f. klin. Med., 1899, 38, p. 87.
6. Sachs: Ztschr. f. klin. Med., 1900, 41, p. 434.
7. Rosenberger: Deutsch. med. Wchnschr., 1906, p. 994.

In 20 liver cases he found alimentary dextrosuria but once, which is in marked contrast to the French observers, who found it quite a usual occurrence. This discrepancy is best explained by the fact that these men used cane-sugar as a test instead of dextrose (see Schapiro[2]). DeHaan[8], in fact, reported 29 cases studied with regard to the assimilation of glucose and found 18 positive and 11 negative, but his own statement of having used 150 gm. of cane-sugar, and only in doubtful cases having recourse to the polariscope, robs his paper of any scientific value. Lépine[9] shares this view, and in his article he contributes one case of liver disease showing alimentary levulosuria.

Bruining[10] studied 21 hepatic cases with levulose, saccharose and glucose. Of the 12 cases studied with levulose, he found 10 (all cirrhosis) positive and 2 negative. Of these two, one was carcinoma of the stomach and liver, with absence of free hydrochloric acid and much lactic acid, which he thinks interfered with absorption of levulose; the other case was one of cirrhosis. Here, then, in 11 cases of cirrhosis he found 10 positive with levulose, or 90 per cent., corresponding exactly with Strauss' figures; and Bruining lays great stress on the importance of this test. With saccharose, it might be stated, he got 13 positive glucose reactions. He hints at the future possibility of diagnosing liver diseases by the way various sugars are utilized, and reports cases, one beginning cirrhosis, one of catarrhal icterus, and one in which there was no alimentary glycosuria or levulosuria, but after saccharose there appeared glycosuria in all three. He does not explain this apparently strange phenomenon.

Baylac and Arnaud[11] in the same year at the French medical congress, held in Toulouse, made a report on the clinical value of alimentary levulosuria, based on the study of 23 liver cases. Of these 21 showed levulosuria, or a percentage of 91 positive reactions. Of 20 cases presenting no symptoms referable to the liver, they found alimentary glycosuria in 7, or a percentage of 35, which is in marked contrast to the 10 per cent. of Strauss. Baylac and Arnaud guardedly add, that as these apparently liver-healthy cases occurred in hospital patients, it may be that there was some derangement of hepatic function, which would account for some of the reactions.

Landsberg[12] the next year gives his experience with 21 cases of liver disease, only 9 of which or 43 per cent. gave a positive result.

TABLE 1.—LEVULOSURIA IN 21 HEPATIC CASES (LANDSBERG)

Disease.	No. cases.	Pos.
Carcinoma	4	1
Cirrhosis	11	4
Hypertrophic cirrhosis	2	2
Congested liver	1	0
Icterus after calculi	1	0
Chronic obstruction of common bile-duct	2	2
	21	9

To prove his point regarding the futility of levulose as a test, he gave levulose to seven healthy persons. He obtained positive results in four, and concluded that Strauss probably took far-advanced cases for his series, in which a collateral circulation had been established, and that in this way there was rapid entrance of levulose into the blood and urine. On these seven cases he makes the rather bold assertion that as the test is positive in health, it has no value clinically, adding that he believes idiosyncrasy plays more of a rôle in alimentary levulosuria than does functional disease of the liver.

Although hardly bearing on this subject, an observation of Samberger[13] has some significance. Briefly stated, Samberger endeavored to prove that the urobilinuria seen so often in syphilis was of hepatic origin, and selected as his vehicle levulose as recommended by Strauss, with results in accordance with Strauss, Sachs Bruining and others, i. e., urobilin was present in those cases which showed levulosuria.

In 1904 Chajes[14] collected all reports on alimentary levulosuria published up to that time, adding 21 normal cases, showing only one positive levulose reaction. He includes in his table 16 cases published by Ferannini with 11 positive reactions or 69 per cent. Of 84 reported cases of clinically diseased livers, Chajes found 86 per cent. showing alimentary levulosuria; of 99 sound as to their liver, 15 per cent. showing alimentary levulosuria. He concludes the former is about the percentage of alimentary levulosuria.

Von Halász[15] criticizes Strauss' work, as he thinks that the patient might have had a low assimilation limit for all sugars, but he confirms Strauss' observations and those of other writers. Von Halász thinks the test of great service in deciding between cirrhosis and other conditions, and states that normally 100 gm. levulose rarely causes levulosuria; a positive result therefore suggests a diffuse and consequently severe disease of the liver, especially indicative of cirrhosis.

The method of examination adopted in this series was as follows: No food was given the patient after the evening meal. The patient voided his urine at a stated hour the next morning, after which, on a fasting stomach, he was given 100 gm. of levulose dissolved in 500 c.c. tea or water according to taste, the whole amount being taken within fifteen minutes. At the termination of each hour thereafter, for four consecutive hours, the urine was collected in four separate bottles, after which breakfast was eaten. It was impossible in some instances to obtain urine each hour, in which case collections every two hours had to be resorted to. Each specimen of urine, including that passed before the beginning of the test, was examined separately by the Fehling, Nylander, Seliwanoff, and fermentation tests, and the combined urine with the exception of the urine before the ingestion of levulose, by the above tests, and in addition by Rosin's method and by the polariscope. As the number of cases increased the spectroscopic examination was omitted. Despite the criticism lately directed against the Seliwanoff reaction by Borchardt,[16] I regard the test as a very useful one, and so far in my experience the disturbing factors mentioned by him have not been met with. Reliance was not placed on this reaction alone, and the presence of levulosuria was accepted as certain, only when there was reduction of the Fehling's and Nylander solutions, fermentation with yeast, a positive Seliwanoff test, and left rotation with the polariscope.

In performing the Seliwanoff test care must be taken not to confuse the rose tint obtained with many urines by boiling with hydrochloric acid, with the typical color reaction due to levulose. In the first instance the shade of red is very light, and fades away entirely on standing or on cooling, while the color in the latter case is a dark magenta red, clouding the entire specimen of urine and deepening on standing or on rapid cooling. The color due to levulose persists for days and there is deposited on the bottom of the test-tube a dark red precipitate.

8. De Haan: Arch. f. Verdauungskr., 1898, iv, 4.
9. Lépine: Semaine méd., 1901, p. 105.
10. Bruining: Berl. klin. Wchnschr., 1902, No. 25.
11. Baylac and Arnaud: Compt. rend. Congr. franç. de. méd. Toulouse, 1902, ii, 98.
12. Landsberg: Deutsch. med. Wchnschr., 1903, p. 563.
13. Samberger: Arch. f. Dermatol. u. Syph., 1903, p. 89.
14. Chajes: Deutsch. med. Wchnschr., 1904, p. 696.
15. Von Halász: Wien. klin. Wchnschr., 1908, p. 37.
16. Borchardt: Ztschr. f. phys. Chem., 1908, p. 241.

The cases reported in this paper number thirty-two, and most were seen in the private practice of my chief, Dr. Musser, and in his wards at the University and Presbyterian hospitals. Additional cases were furnished me by Dr. Alfred Stengel, Dr. James Tyson, Dr. D. F. Woods, Dr. E. J. G. Beardsley, Dr. J. H. Musser, Jr., Dr. W. Taylor Cummins, and Dr. M. Solis-Cohen, to all of whom I wish to acknowledge my great indebtedness.

In the first ten cases the tolerance for glucose and saccharose in addition to levulose was tested, but this necessitated so much inconvenience on the part of the patients that it was omitted in the remaining twenty-two cases. I believe, nevertheless, that in all instances in which alimentary levulosuria can be demonstrated, the tolerance for glucose and saccharose should be determined, since there may be, in certain individuals, a normally low assimilation limit for all sugars.

In hepatic disease, after 100 gm. of levulose, the sugar usually appears in the second-hour specimen, after which time it either varies in degree or is absent entirely from the succeeding portions of urine. Strauss has already observed this phenomenon. The appearance of levulose is tardy and of short duration in cases in which the liver is but moderately affected; it is, however, rapid, intense and prolonged in cases of profound alteration, so that alimentary levulosuria may perhaps be regarded as an early symptom of hepatic disease (cf. Baylac and Arnaud[11]).

I was unable in the majority of instances to confirm the diagnosis by postmortem examinations, so it was impossible to control the extent of the hepatic lesion, but judging from the clinical course of the individual cases, I believe the inference to be drawn from the early or late appearance of levulosuria, as stated above, is correct.

As will be seen from a study of the table, all of the cirrhosis patients exhibited alimentary levulosuria, the early appearance coinciding with severe disorders and the tardy appearance with the clinically mild affections.

One case (No. 3) of marked fatty degeneration (autopsy) showed levulosuria in the first hour.

All of the six subjects of hepatic enlargement due to chronic passive congestion assimilated 100 gm. of levulose easily. In these cases the tolerance was of considerable assistance in arriving at a proper diagnosis.

One patient with ovarian cyst (No. 26; operation) had certain symptoms of cirrhosis, but showed no alimentary levulosuria, and at operation the liver was found to be apparently healthy.

Levulose was given by mistake to the diabetic patient (No. 22) instead of to another patient in the same ward. There was a marked intolerance, which is the more remarkable as diabetics are supposed to utilize levulose well (Külz,[17] etc.).

Alimentary levulosuria was present in one case (No. 27) of catarrhal cholangitis in which a cirrhosis could not be excluded.

The one patient (No. 31) with supposedly syphilitic cirrhosis utilized levulose perfectly. The clinical diagnosis was at first carcinoma of the liver, but was later changed to the one given in the table.

Patient 32 (carcinoma of the gall-bladder) excreted levulose in the last two hours following ingestion of the same.

17. Külz: Quoted by von Noorden, Handbuch der Pathologie des Stoffwechsels, 1907, ii, 53.

TABLE 2.—LEVULOSURIA IN 32 PATIENTS

(100 Gm. Sugar Administered in Each Case)

Cases.	Form of Sugar.	Excretion by hours 1	2	3	4	Diagnosis.
1	Levulose	—	0	++	+	Cirrhosis
	Glucose	0	+	++	0	
	Saccharose	0	0	0	0	
2	Levulose	+	+	0	0	Cirrhosis
	Glucose	0	0	0	0	
	Saccharose	0	0	+	+	(levulose test)
3	Levulose	+	++	0	0	Fatty degeneration
	Glucose	0	0	0	0	
	Saccharose	0	0	0	0	
4	Levulose	0	+	+	—	Cirrhosis
	Glucose	0	0	0	0	
	Saccharose	0	0	0	0	
5	Levulose	0	++	+++	+	Cirrhosis
	Glucose	0	0	0	0	
	Saccharose	0	0	0	0	
6	Levulose	+	++	+	+	Cirrhosis
7	Levulose	+	+	+	+	Cirrhosis
8	Levulose	—	0	0	+	Cirrhosis
9	Levulose	++	+	+	—	Cirrhosis
10	Levulose	+	0	0	+	Cirrhosis
11	Levulose	+	++	+	+	Cirrhosis
12	Levulose	+	+	++	0	Cirrhosis
13	Levulose	+	++	+	0	Cirrhosis
14	Levulose	+	++	+	0	Cirrhosis
15	Levulose	+	0	+	++	Cirrhosis
16	Levulose	+	+++	+	0	Cirrhosis
17	Levulose	0	+	+	0	Cirrhosis
18	Levulose	—	+	+	+	Cirrhosis
19	Levulose	0	—	+	0	Cirrhosis
20	Levulose	0	+	++	+	Cirrhosis
21	Levulose	+	++	+	+	Cirrhosis
22	Levulose	+	++	+++	+	Diabetes
23	Levulose	0	0	0	0	Myocarditis
	Glucose	0	0	0	0	with secondary hepatic congestion
	Saccharose	0	0	0	0	
24	Levulose	0	0	0	0	Tricuspid insuf.
	Glucose	0	0	0	0	with hepatic congestion
25	Levulose	0	0	0	0	Chronic Pass.
	Glucose	0	0	0	0	cong. Myo-
	Saccharose	0	0	0	0	carditic Nephritis
26	Levulose	0	0	0	0	Ovarian cyst
	Glucose	0	0	0	0	
	Saccharose	0	0	0	0	
27	Levulose	0	++	++	+	Catarrhal Cholangitis. Cirrhosis (?)
28	Levulose	0	0	—	—	Chronic Pass. Cong. Myocarditis
29	Levulose	0	0	0	0	Chronic Pass. Cong. Nephritis
30	Levulose	0	0	0	0	Nephritis. Chr. Pass. Cong.
31	Levulose	0	0	0	0	Syphilitic Cirrhosis (?)
32	Levulose	0	0	+	+	Carcinoma of
	Glucose	0	0	0	0	Gall bladder
	Saccharose	0	0	0	0	

SUMMARY

DIAGNOSIS.	TOTAL.	POSITIVE.	NEGATIVE.
Cirrhosis	20	20	0
Cirrhosis (?) Syphilitic	1	0	1
Fatty Degeneration of Liver	1	1	0
Chronic Passive Congestion	6	0	6
Catarrhal Cholangitis-Cirrhosis (?)	1	1	0
Carcinoma of Gall-Bladder	1	1	0
Ovarian Cyst	1	0	1
Diabetes Mellitus	1	1	0
Total	32	24	8

Percentage Positive Reaction 75
Percentage Positive Reaction in Cirrhosis 100
Percentage Positive Reaction in Chronic Passive Congestion .. 0
Percentage Positive Reaction in Disease of Liver, Bile-Ducts and Gall-Bladder 97
Percentage Positive Reaction in Non-Hepatic Disease 12.5

CONCLUSIONS

1. Alimentary levulosuria is almost a constant phenomenon in cirrhosis of the liver.

2. The early or late appearance of levulose may be regarded as a sign of severe or mild hepatic disease.

3. Alimentary levulosuria is a useful aid in diagnosing between cirrhosis on the one hand and chronic passive congestion on the other.

4. A study of the hepatic function with glucose and with saccharose in addition to levulose is to be desired, inasmuch as there may be an individual intolerance to carbohydrates.

5. While not indicative of any specific organic lesion of the liver, alimentary levulosuria is most frequently observed in cirrhosis.

248 South Twenty-first Street.

ABSTRACT OF DISCUSSION

DR. DE LANCEY ROCHESTER, Buffalo: Did Dr. Goodman find the reaction positive in cases of mixed cirrhosis and passive congestion?

DR. J. R. WILLIAMS, Rochester, N. Y.: I have attempted to examine some cases in the way described by Dr. Goodman, with unsatisfactory results. Investigations of this sort may easily be carried on in an endowed hospital, but sometimes they are not practicable in private practice. For example, levulose costs about 80 cents an ounce, making the cost of a single examination about $2.50, obviously a prohibitive cost to the general practitioner. I have attempted to carry out the test using honey instead of levulose; honey contains approximately 50 per cent. of levulose. My experience with it is too limited, however, to enable me to express an opinion as to its value.

DR. EDWARD H. GOODMAN, Philadelphia: It was impossible in my series of cases to control the clinical diagnosis by autopsy, so I can not say just how extensive the hepatic lesion was. I obtained levulose from Schering & Glatz of New York, one pound costing $1.60.

WATER CONTAMINATION ABOARD SHIP AND ITS PREVENTION

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MILWAUKEE

There are four methods of supplying drinking-water aboard ship. The first is the storage of the water in tanks and barrels which have been filled over the side from some regular supply, such as a water-boat which has run alongside. By the second the water is pumped in, or otherwise forced into the tanks, through a hose, from a city supply, over the side. By the third method the ship takes water in midstream, or when out in the lakes, by pumping through the sea-cock. The fourth method is to condense the drinking-water from steam. It sometimes happens that a fifth method of obtaining drinking-water is used by the crew, as, for example, when the ship is lying in fresh water it is common practice for the men to haul a pailful of water over the side, as this is cooler than the water stored in the tanks or barrels.

Of all the methods, it is readily seen that there is only one which can be relied on for purity, namely, the drinking-water from the condenser. All other sources are dangerous to a greater or lesser degree. Especially is this true at the present time, when it is asserted that our Great Lakes have sewage contamination several miles from shore, and most of our great shipping centers have dangerous water-supplies. It is not a surprising statement, then, that seafaring men have considerable typhoid on the Great Lakes. That some of these cases of typhoid are contracted on shore, is probably true, but that most of them originate aboard the boats, from contaminated water, is too evident a fact to be disputed. And this contamination of the water on shipboard is the result of faulty construction and a reckless disregard of sanitary principles, by all the vessels on the Great Lakes, whether private or owned by the government.

I know of no steamer on the lakes that uses a condenser; nor do I know of any boat, of any description, that takes drinking-water over the side except when laid up in the winter. It is, then, fairly safe to say that all drinking-water used aboard vessels on the lakes, for the crews and passengers, is admitted to the boats through the ordinary sea-cocks. And if this is true, then passengers and sailors are constantly drinking water which has passed through pipes that have been lying in sewage while the ship was in port. All water used aboard, for whatever purposes, is pumped through the sea-cocks which perforate the shell of the ship in the bottom, as indicated by the arrow in the diagram, which represents a cross-section of a ship, the sea-valve, pony-pump and pipes to drinking-tanks. Now suppose that valve A is kept closed when not in use—which is never the case except when the boat is laid up for the winter—then when the ship lies in the Chicago River, say, all that portion of the piping and sea-cock, from the bottom of the boat to valve A, stands filled with sewage, or Chicago River water, which is the same. But let us go farther: Suppose that the boat is loaded down so she lies in the water to the depth indicated by B, then the river-water would rise through the sea-cock to the level of B at C. From the sea-cock to the pony-pump is a long stretch of pipe in most steamers, and as the pony-pump is constantly in action to maintain the pressure in the various pipes, and to feed the boilers, it is plain that all this section of pipe is filled with sewage all the time that the boat lies in foul water. It is not hard for one to picture the scum and deposits which form on the inside of this portion of the piping from the sea-cock to the pump; and even though the drinking-tanks are not filled until the ship is well out in clear water, and not until the water has been forced through the sea-cock and overboard, until it comes through clean (?), still

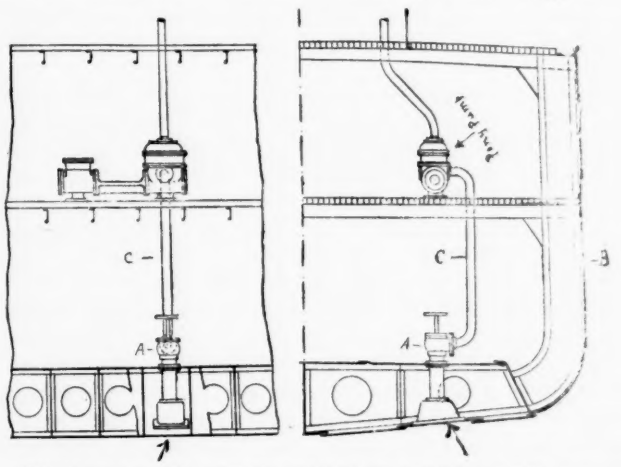

Diagram of a ship, showing method of supplying drinking-water on shipboard; a, valve to shut off river-water; b, c, level to which river-water may rise when boat is loaded down. The diagram shows, on the left, a section taken fore and aft, and, on the right, across the hull.

the very thought that one is drinking water which has passed through a pipe which has but a few hours before been standing full of sewage in which macerated animals and solid fecal matter are churned into solution is, to say the least, just short of nauseating. It is quite certain that the sea-cock and the pipes leading to the drinking-tanks are coated with slime and vegetable growth in which there surely must be the bacterial life common to sewage.

On certain steamers the water-bottoms are filled through the sea-cocks, and the big iron ore steamers run alongside the docks and as the ore is unloaded the water is let in to trim ship regardless of where the boats are lying. If the boat is lying in the Chicago River, or South Chicago, it makes no difference, for this water is run into the water-bottom, just the same, sewage and all. When unloaded the ship clears for another cargo, holding this water in the bottom, or pumping it overboard,

as the exigencies of the weather permit, and when the drinking-tanks need filling, a valve is opened, and the tanks filled through the very selfsame sea-cock that was used for filling the bottom with sewage. Clearly the drinking-water for the tanks should not be pumped through the same pipes through which millions of gallons of sewage have just been pouring. It is probably true that flushing these pipes when in clear water does wash out most of the bacterial content which might otherwise cling to the vegetable growth in the pipes, but from any point of view it is absolutely disgusting to think of drinking water which has been pumped through a pipe which in the last few hours has been filled with Chicago or Milwaukee sewage.

The vessels from which the U. S. Public Health and Marine-Hospital Service receives most of its typhoid patients are the passenger boats with short runs. The main reason for this is that these boats lie in the river half of the time, and their pipes are, therefore, more contaminated than those of other ships, and there are greater chances of carelessness, such as leaving open the valves when entering the rivers, etc. It is true that the drinking-tanks are not filled until the boat is well out in clear water, and then some one opens the lateral to the drinking-tanks and lets it run until the tanks are filled. And frequently this valve is left open after the boat has entered the rivers, and the tanks are filled with sewage. If the captain discovers this carelessness, the tanks are immediately emptied and cleaned; but it must often be the case that the men or junior officers who are responsible for such a mistake will keep the matter quiet for fear of reprimand.

The drinking-water is pumped into iron tanks; these are supposed to be cleaned out several times a year, but it is a fairly safe guess that investigation would show that many of them have not been even fairly well cleaned more than twenty times in twenty years. That they are ever thoroughly and safely cleaned is impossible, as any one can easily convince himself of by a personal examination. It is admitted by every well-informed person with whom I have discussed the matter that these tanks become very foul, and are lined inside with vegetable growth and a thick slimy deposit. That typhoid bacilli get into these tanks at various times, in greater or smaller quantities, and that these same bacilli multiply on this fine medium, would seem to be a safe assertion.

Not a few times has the fact been noticed by officers of the Public Health and Marine-Hospital Service that some one particular vessel was sending an unusual number of cases of typhoid to hospital, and when conditions were looked into carefully it has always been found that there was carelessness and lack of sense and cleanliness on the part of the ship's officials. But the prime fault is one of construction, for it is impossible to guard against carelessness in this particular. In the first place, a general pipe system which lets water into the water-bottom, and to the boilers and the sanitary tanks, and the tanks for drinking-water, and through which the decks are flushed down, is a dangerous system.

I have the statement of captains to the effect that it has happened several times that vessels have come to their docks in Chicago or Milwaukee rivers with their drinking-tanks overflowing with dirty water from the rivers, because some careless person has left the valve open, and the constantly working pony-pump has kept pumping water into the tanks after the ship has entered the foul rivers. There is still another method by which the drinking-tanks can be fouled, and that is by leakage past a poorly fitting valve. The fire-drills aboard ship are most often held while in port; and almost all deck washing is done while lying at the wharf. The pony-pump is constantly running, but during fire-drill, and washing down deck with the hose, the big pump is turned in and the greater pressure in the pipes probably causes a certain amount of leakage into the drinking-tanks, past valves which may not be properly seated. This is probably a common occurrence on most boats.

All water aboard ship, for whatever purposes, must first pass through the sea-cock and pipes leading from it, and it must be alarming for one to discover, while a passenger on these vessels, many of which are floating palaces, that he has been drinking water which was introduced into the ship through pipes smeared on the inside with sewage. It cannot be clean, cannot be free from bacterial life and fecal matter. Surely no man would dare say that such water was clean and free from danger.

There are but two practical methods to avoid this contamination. One is to disconnect the drinking-tanks from the other pipes, so that it would be impossible to fill them with foul water accidentally. Then it would be necessary to drop a pipe over the side when out in clear water, and pump the water into the tanks. All the officers with whom I have discussed the matter think that this method would also be objectionable because some one would forget to haul in the pipe that was over the side. In the second method, and the only reliable way to obtain absolutely pure water, is to condense it, as is done by ocean-going steamers. It could be installed on any steamship with comparatively little expense.

403 Iron Block.

LOCALIZED SUBPHRENIC TUBERCULOSIS

EXCISION OF THE TUBERCULOUS MASS; RECOVERY; FREEDOM FROM RELAPSE AT THE END OF TWO YEARS *

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DENVER

Patient.—Mr. X., a man of 28, came to Colorado in the spring of 1907 with a moderate tuberculous invasion of both lungs. His home was in Boston, and for some months before leaving there he had suffered with pain and discomfort in the region of the gall bladder. A diagnosis of gall-bladder trouble had been made by two physicians and this was confirmed by Dr. Swan of Colorado Springs, through whose kindness I saw the patient. When I saw the young man with Dr. Swan in the latter part of April, 1907, I found him fairly well nourished; his chest trouble was in apparent arrest, he was without fever, he had a good appetite and was possessed of a fair degree of general strength. The pain and discomfort in the region of the gall bladder had recently become more marked. He had had no jaundice; he had not suffered acute pain, but the dull pain and constant discomfort had become a marked and disturbing factor in his daily life. The pain was apt to come on at night and keep him awake.

Examination.—The abdomen was found to be soft; there was no local rigidity. There were no evidences in the region of the appendix. There was moderate tenderness on deep pressure at the site of the gall bladder and this tenderness was constant. This was about the only symptom presented. The diagnosis of probable gallstones was concurred in and operation advised.

Operation.—At St. Luke's Hospital, in Denver, May, 1907; ordinary gall bladder incision. Careful inspection and palpation revealed nothing abnormal in the gall bladder or bile ducts. The cecum and appendix were explored and found to be normal. At about the middle of the liver there were adhesions

* Read in the Section on Surgery of the American Medical Association, at the Sixtieth Annual Session, Atlantic City, 1909.

between it and the anterior abdominal wall. These adhesions were not very dense and were broken through. Small, apparently tuberculous nodules were seen on the upper surface of the liver. On drawing the liver down a caseous mass about as large as the bowl of a dessert-spoon was found between the middle of the upper surface of the liver and the diaphragm and involving both. This was excised with some difficulty and its bed scraped and mopped with carbolic acid and alcohol. Moderate hemorrhage was checked by packing. Outlying nodules were excised. Free gauze packing was placed between the liver and the diaphragm. The remainder of the wound was closed.

The tissue removed was sent to Dr. J. A. Wilder, professor of pathology in the University of Denver, who pronounced it tuberculous.

Postoperative History.—The patient made a smooth convalescence; his sinus became permanently closed at the end of ten weeks. He has had no further trouble in the region of the liver. In February, 1908, he developed moderate appendiceal symptoms and a somewhat thickened appendix was removed, which on pathologic examination was pronounced tuberculous by Dr. Wilder. Since then the patient has had no abdominal symptoms whatever. I examined him recently, two years after the operation on the liver. His lungs are in good condition; his weight, strength and appetite are good; he feels well and enjoys life. There is no hernia at either scar and aside from the scars themselves there are no abdominal evidences. There is no evidence to be discovered of tuberculous peritonitis in any portion of the abdomen. His digestion is good; he has no discomfort.

We have in this case a localized subphrenic tuberculosis. Thorough excision of the tuberculous area was followed by healing. Two years after operation there was no evidence of relapse.

A thorough search of medical literature, in which quest I have had the kind aid of Dr. F. Robbins of New York, fails to reveal a definitely similar observation.

Eisendrath[1] reports a case of general tuberculous peritonitis with a localized subphrenic collection of fluid. Michaux[2] makes a somewhat similar observation. In his case the patient's illness began abruptly with severe dyspnea under the picture of pneumothorax. There were no gastrointestinal symptoms. Edema existed on the right side of the chest, the abdominal wall and the legs. There was a high fever. An incision along the costal arch served to evacuate gaseous pus and opened into a large cavity, reaching as far as the third rib. The operation was followed by marked improvement. The edema diminished, but subsequently an uncontrollable diarrhea developed and the patient died one month after the operation. The autopsy showed the presence of dry tuberculous peritonitis which had given rise to the formation of a subphrenic abscess.

Consideration of subphrenic abscess as a complication of an intrathoracic affection is of interest. According to Archibald,[3] this complication is extremely rare. Among 447 cases compiled by Maydl (1894), Grüneisen, and Perutz, only 21 owed their origin to this cause; including 6 instances of empyema after pneumonia; 7 instances with an unknown source of infection; 1 instance of pulmonary abscess; 2 instances of pulmonary gangrene, and 1 instance of tuberculosis. In the cases compiled by Maydl prior to 1894, with a singe exception, there was invariably found a perforation of the diaphragm. This was not demonstrable in the later cases, treated by operation, showing that the diaphragm is only gradually destroyed, later, at one or more points, as the result of the prolonged contact with the pus.

The mode of passage of the infection from the pleural to the subphrenic cavity is of interest. Küttner[4] seeks an explanation in the course of the lymph current, which was demonstrated by him through careful experimental injections. The lymph channels of the parietal pleura and peritoneal serosa communicate with those of the diaphragm, and in the diaphragm itself exist many perforating lymph vessels, not only in the direction from the peritoneum to the pleura, but also in the opposite direction. According to Burkhardt, the bacteria penetrate through the membranes and muscles by active growth instead of by passive transportation. It is possible that the metastasis is caused in either fashion. This work of Küttner has special reference to the transmission of chronic inflammatory processes from one of the two large body-cavities to the other. Küttner discusses, in the first place, tuberculosis of the serous membranes. He quotes Tilger,[5] who examined the autopsy material of the Geneva Pathologic Institute in regard to the question as to whether tuberculous peritonitis can infect the pleura by way of the diaphragm. Among forty-nine cases of extensive tuberculosis of the peritoneum, he found the pleura to be affected in thirty cases. In almost all of these, however, the pleurisy had originated independently of the peritonitis, or a chain of tuberculous lymph glands could be followed from the abdominal cavity to the thoracic space. It was only in three cases that the pleurisy had been positively transmitted from the peritoneum through the diaphragm. In one instance the peritoneal tuberculosis had led to an affection of both pleuræ; in the other two cases the right pleura alone was infected; here the process was not tuberculous in character, at least not microscopically, and Tilger assumes that only the purely inflammatory factor of the tuberculous peritonitis was transmitted through the diaphragm to the pleura. He regards it as probable that propagation in both cases took place through the lymph vessels of the diaphragm. Tilger thinks that this assumption is favored by the right-sided location of the pleural disease in both cases (relations between the lymph vessels of the liver and the right pleura). It follows, according to him, that the perforating lymph vessels of the diaphragm do not play a very important part in the primary tuberculosis of the serous membranes, but that tuberculous peritonitis and pleurisy should almost invariably be regarded as equivalent affections, arising on an identical basis (polyserositis of Italian authors).

In a general way it may be said that certain clinical cases, otherwise difficult of interpretation, may be explained in a similar manner by the perforating lymph vessels of the diaphragm, which traverse the diaphragm in the direction from peritoneum to pleura and *vice versa,* establishing numerous communications between the two large body-cavities and even providing for their relations with remote regions.

An isolated observation by Muck[6] is as follows: The patient presented bronchial bruits over the lungs and had a slightly febrile temperature. There were no other symptoms suggestive of tuberculosis. Death occurred as the result of exhaustion; at the autopsy old tuberculosis was found in the left apex and a cavity in the right apex; there was a broken-down focus in the right

1. Eisendrath, Daniel D.: The Acute Forms of Abdominal Tuberculosis, THE JOURNAL A. M. A., Jan. 23, 1909, lii, 291.
2. Michaux: Bull. et Mem. Soc. de chir. de Paris, 1897, xxiii.
3. Archibald: Brit. Med. Journal, May 19, 1906.
4. Küttner: Beitr. z. klin. Chir., 1903, xl.
5. Tilger: Virchow's Arch. f. path. Anat., 1894, cxxxviii.
6. Muck: Inaug. Diss., Munich, 1894.

lower lobe. A subphrenic abscess, probably tuberculous, though not microscopically examined, was demonstrated on the right side.

Cornet[7] considers that tuberculous changes in the liver as a sequel to pulmonary phthisis are uncommon. The liver is most frequently affected in general miliary tuberculosis, under the formation of disseminated miliary tubercles, apparently not uncommonly immediately before the death of consumptive individuals. Localized tuberculosis of the liver often appears under the picture of enormous isolated, softened, tuberculous ulcers (Orth, Simmonds, Zehden, Wagner, Clement).

Hepatic tuberculosis originates by the hematogenous route, through the bowel, or through the peritoneum. In addition the hematogenous route practically opens all the organs of the body to the bacilli. This view is supported by Lubarsch,[8] who cites investigations on tuberculosis of the stomach (Simmonds, Bindo de Vecchi) of the heart muscle (de Vecchi), the muscles of the body (Saltykow), etc.

Of contributory interest is the work of Kelynack.[9] In 3,053 autopsies Kelynack found distinct hepatic cirrhosis in 121 instances. In 28 cases (23 per cent.) there existed a tuberculous infection, either in the shape of active process, latent or old tuberculosis. Pulmonary tuberculosis was found in 14 cases (12 males, 2 females). Among these cases the lungs and the peritoneum were simultaneously affected in 6 males and 1 female; the lungs alone in 5 males and 1 female; the peritoneum alone in 2 males and 2 females. Latent or old tuberculosis was present in 8 per cent. of the cases. The average age in active tuberculous processes was 45½ years; in tuberculous pulmonary disease, a little above 44 years; in disease of the peritoneum, barely 47 years; in latent or old pulmonary tubercles, a little over 44½ years.

Tuberculous pleuroperitonitis is discussed at length by Zelistratow.[10] Zelistratow gives a brief description of the clinical picture of the disease and five personal observations: One case was associated with general miliary tuberculosis; in another case the pulmonary and intestinal symptoms were so marked that the affection of the pleuræ and the peritoneum was of minor importance only. In Cases 3 and 4, the affection of the pleura and peritonitis were the only symptoms; in Case 5 these were the predominant symptoms.

The Influence of Proteids and Carbohydrates on Metabolism.—It was sought to determine the immediate effects of these two classes of foodstuffs on the products of metabolism. A. Gigon (*Skandin. Arch. f. Physiol.*, 1909, xxi, 351) made observations on himself, which were of ten hours' duration. Every quarter hour during the observations, doses of casein (155.6 gm.), dextrose (460 gm.) and of dextrose and casein (equal to the sum of these two) were administered. The experiments were carried out in the Sondén-Tigerstedt respiration apparatus, and in addition the exchange of nitrogen and phosphorus were determined. It was found that proteids as well as sugar increased the output of carbon dioxid and that the mixture of proteids and sugar increased the output of carbon dioxid to an extent which equaled the sum of the output from sugar and proteids when given separately. The doses of sugar, however, had no appreciable immediate effect on the exchange of nitrogen or phosphorus.

7. Cornet: Die Tuberkulose, Vienna, 1907.
8. Lubarsch: Encyclop. Jahrb. d. ges. Heilk., 1904, II.
9. Kelynack: Med. Chron., January, 1897.
10. Zelistratow: Klin. Jrl. Russ., December, 1901; Centralbl. f. d Grenzgeb. d. Med. u. Chir., 1902, v.

SURGICAL TREATMENT OF TUBERCULOUS PLEURISY, LUNG ABSCESS AND EMPYEMA *

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It is an established fact that at least 70 per cent. of all cases of the serofibrinous type of pleurisy in adults are of tuberculous origin, the figures of various observers varying from 15 per cent. to 82.6 per cent.

I need not here review the literature or quote statistics which establish this fact, since this has only recently been done by Lord[1] and in 1908 by S. Goodall,[2] but I shall briefly discuss the methods by which we may ascertain the true etiology of pleuritic effusions.

We shall here exclude the transudates due to circulatory disturbance, kidney affections, cancer, or injuries to the pleura and confine our study to the forms which are associated with or follow inflammatory diseases of the lungs, pleura or neighboring organs.

Dealing, then, with only inflammatory types of effusions, our first step is to determine what disease is its causative factor. Is it a tuberculous or one of the more acute forms of inflammation, such as lobar or bronchopneumonia, rheumatic arthritis, etc., or a suppurative disease of a neighboring organ, as, for instance, an abscess of the liver, spleen or mediastinum?

Since a large percentage of pleural effusions are associated with pulmonary tuberculosis, we shall naturally suspect most cases to be of such origin and shall search for verification.

METHODS OF DIAGNOSIS

The cytodiagnosis takes first place. It was first advanced by Widal and Ravaut, and verified by many observers, especially by Musgrave,[3] who analyzed seventy-two cases at the Massachusetts General Hospital. Musgrave approved Widal's formulated rules for differentiation, which are as follows:

1. A predominance of lymphocytes in the effusion indicates an early stage of tuberculosis of the lungs.

2. A predominance of polymorphonuclear leucocytes indicates that the effusion is due to an acute infectious process.

3. A large number of endothelial cells occurring in sheets or plaques means mechanical effusion or a transudate.

The tuberculous variety is divided into two classes: a class of cases which are forerunners of pulmonary tuberculosis, at least in which no tuberculous lesion can be discovered by physical examination, called the primary form, and then a group in which the pleurisy is associated with a well-pronounced tuberculous disease of the lung, the secondary form.

In the primary and most common form the lymphocytes predominate. During the first week or ten days in a tuberculous effusion the polynuclear cells may predominate, but these rapidly disappear and give place to a purely lymphocytic form.

* Read in the Section on Surgery of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.

* Owing to lack of space the article is here slightly abbreviated. It appears in full in the Transactions of the Section and in the author's reprints.

1. Lord: Treatment of Serofibrinous Pleuritis, Boston Med. and Surg. Jour., April 15, 1909.
2. Goodall, S.: The Relation of Pleurisy to Pulmonary Tuberculosis, Med. Rec., June 27, 1908.
3. Musgrave, P.: Examination of Pleural Fluids with Reference to their Etiology and Diagnostic Value, Boston Med. and Surg. Jour., 1904, pp. 317, 347, 377, 406.

In the secondary form, which is not so frequent (about 1 in 10) the sediment does not contain many lymphocytes, but consists principally of necrotic cells which are not entirely degenerated, the larger percentage being polynuclear.

Next to cytodiagnosis the process of "inoscopy"[4] is of diagnostic value. It enables us to find the tubercle bacilli in the effusion by means of a process of digestion of the fluid before staining.

The method of animal inoculations with the pleuritic fluid is another valuable aid in proving the correct diagnosis, but is, on account of the time required for the test, not very practical.

Another diagnostic aid which has recently become very popular is the tuberculin test, either by the cutaneous, subcutaneous, or conjunctival method. Its true value in this capacity is at the present time a subject of animated discussion in the medical world and will, no doubt, be decided by those who are now testing its reliability in thousands of cases.

The radiograph of the chest has, as yet, not received its merited appreciation as a diagnostic aid. By means of this quite recently developed adjunct we are able to recognize pleural effusion as well as pulmonary tuberculosis in the early stages in the lung, and when the two coexist we have evidence that the effusion is of tuberculous origin.

The literature on the radiograph as a diagnostic aid in diseases of the chest dates back as far as 1896 (Walsham[5]), and its more extensive application has been endorsed and perfected by Rieder,[6] Krause,[7] Holland[8] and many others.

The skiagraph is an accurate record of the presence and location of a lesion or fluid within the chest. Its interpretation is submitted to the acutest of our senses, the sense of sight. The eye, of all the senses, is the least liable to be deceived, and a perfect radiograph, if properly interpreted, is a valuable guide in the early diagnosis of tuberculosis, with or without effusion.

Recently I brought to the attention of the State Medical Society of Illinois an innovation in this diagnostic aid, which enables us not only to discern the earliest signs of tuberculous disease, but also to differentiate an active tuberculous process from a latent one, i. e., *the stereoradiograph of the chest* (Fig. 1). The stereoscopic effect brings into relief the structures of the lesions while the non-stereoscopic, single radiograph shows only a shadow. The active tuberculous process is recognized by dark shadows surrounded by a halo, the latter indicating the infiltrated area around the tuberculous focus.[9]

Quite different is the picture of an old healed tuberculous process, in which only scars remain in the lung tissue as relics of the disease. Here we find the shadows standing out clearly like spiders, surrounded by clear lung tissue.

Summing up our diagnostic aids, the clinical history, the physical findings, the chemical and bacteriological examination of the blood and secretions, the cytodiagnosis, inoscopy, the tuberculin test, animal inoculation and the stereoradiograph as guides in determining the character of pleuritic cases, we proceed to the treatment.

4. Jousett: Semaine méd., 1903, No. 3, p. 22.
5. Walsham: The *X*-Rays in the Diagnosis of the Chest, Ref. Arch. Roentg. Ray, July, 1908.
6. Rieder: Zur Früh-diagnose der Lungentuberculose mit Hilfe der Roentgenstrahlen, Beitr. z. Klin. d. Tuberc., xii, No. 2, 195.
7. Krause, P.: The Value of Roentgen-Ray Examination in the Diagnosis of Pulmonary Tuberculosis, Especially in Reference to Early Tuberculosis, Am. Jour. Med. Sc., March, 1909, cxxxvii, No. 3.
8. Holland: Diagnosis of Pulmonary Tuberculosis by Means of the *X*-Ray, Liverpool Med.-Chir. Jour., July, 1908.
9. This point is further discussed in a paper which will soon be published in the Illinois Medical Journal.

CURRENT METHODS OF TREATMENT

In the treatment there seem to be some inconsistencies. The idea that as soon as an effusion in the chest is discovered its immediate withdrawal is indicated is still too prevalent among practitioners and it is time that the medical profession take some definite position on this question.

In studying the literature of this subject one is impressed by the growing opinion of authorities that the pleural effusion in incipient cases of pulmonary tuberculosis is a factor promoting the cure of the disease. It is asserted that the collapse of the diseased lung produced by the effusion has a highly beneficial influence on the healing process. This, of course, has relation to the unilateral involvement alone, and many instances in which the spontaneous cure has taken place by either a pneumothorax or pleural effusion are reported in medical literature (Späth,[10] Konzelman[11]). The latter recently published twenty-five cases of all stages of pulmonary tuberculosis with intercurrent pleuritic effusion in which fourteen patients recovered and are able to work, and he regards the pleuritic effusion as the factor conducive to the healing of the underlying disease.

Lord, on the other hand, states that of every 10 cases of primary pleurisy 3 or 4 develop pulmonary or other tuberculosis within four to six years, and advises that every case of serofibrinous pleuritic effusion be treated as tuberculosis.

Autoserotherapy in serofibrinous pleurisy was first introduced by Gilbert and Fede,[12] and its efficiency in absorbing the pleuritic exudates has been corroborated by Nasetti[13] and by Schnutgen.[14] It consists in withdrawing by means of a Pravaz syringe 1 c.c. of the serofibrinous exudate and reinjecting the same at once subcutaneously. These injections are made daily for four or five days, according to the severity of the case, and within twelve to fifteen days the fluid in the chest cavity usually disappears. Bad after-effects were not noted. In fourteen out of fifteen cases of serofibrinous pleurisy thus treated by Schnutgen in the clinic of Professor Senator the results were positive.

Whether this form of treatment of removal of the exudate is of permanent value depends on these salient points: Does the disappearance of the fluid also cure the underlying disease, namely, the tuberculosis? Have these patients remained well or have they developed tuberculosis later on? Nasetti and Schnutgen have not made these points clear, except by suggesting that probably through the subcutaneous injection of the exudate a quantity of antitoxic and antibacterial substances gain entrance into the circulation.

Assuming, then, that the pleuritic effusion is conducive to the healing of tuberculous disease of the lung, is it not irrational to advocate its removal or favor its absorption by medical means, except when urgent symptoms, such as difficult breathing, extremely high blood pressure, or disturbance in the circulation, require immediate relief? Then, of course, it is advisable to withdraw a sufficient quantity to establish equilibrium.

The pleuritic effusion should not be regarded a disease. It is in reality a symptom, just as free fluid in the peritoneal cavity is a symptom of tuberculous salpingitis

10. Späth: Beziehungen der Lungencompression zur Lungentub Würtenberg, Cor.-Bl. lviii, No. 15.
11. Konzelmann: Ueber den Einfluss der pleuritischen Exudate auf den Verlauf der Tuberculose, Beitr. z. Klin. Tuberc., x, No. 4.
12. Gilbert and Fede: Schmidt's Jahrb. d. in.- u. Ausländ. Med., 1907, xcv, 247.
13. Nasetti: Ref. Deutsch. med. Wchnschr., 1908, No. 42, p. 1819.
14. Schnutgen: Berl. klin. Wchnschr., Jan. 18, 1908, p. 97.

or tuberculous appendicitis. Its removal does not cure the underlying disease; on the contrary, it interferes with the healing process. The treatment of tuberculous pleurisy, therefore, should consist in the treatment of its causative factor, namely, the pulmonary tuberculosis.

Returning to the principle of compression of the lung in the treatment of unilateral tuberculosis, we may state that this was inaugurated by Forlanini[15] in 1894, and independently practiced by Murphy[16] by means of injections of nitrogen gas into the pleural cavity, where the adhesions of the lung did not prevent its introduction.

In Germany this method has been tried by Brauer,[17] who published his later experiences with the method in 1906, and recently Carl Lexer[18] published four cases so treated, and the results obtained by all these authors were quite encouraging.

Another method of lung compression was tried by A. Schmidt,[19] which consisted of the injection of oil instead of nitrogen gas.

More recently a radical method has been advised by Brauer, namely, the mobilization of the entire chest wall of the affected side by extrapleural resection of the entire length of as many ribs as will permit the remaining soft structures to fall against the diseased lung and prevent its expansion. It is essential to guard against injuring or opening the pleural space during the operation.

This work has been developed and extensively described by Professors Brauer[20] and Friedrich,[21] and, while the operative procedure is connected with danger and leaves the patient with deplorable deformity, they regard it as justifiable in cases in which the lives of those otherwise doomed unfortunates can be prolonged and made more comfortable.

Professor Friedrich reports ten cases treated in this manner, with three deaths and seven recoveries. This entire series consisted of patients with extensive unilateral pulmonary tuberculosis in which climatic and medical treatment had failed to prevent the spreading of the tuberculous process.

While these various methods differ in their application, the underlying principle in all of them is the same—namely, to bring about a collapse of the diseased lung, thereby suspending its action and putting it to rest for such length of time as may be required for the healing process.

To determine the causes which bring about this improvement has tempted many to investigation. Karl Spengler,[22] Baumler[23] and others have pointed out that pneumothorax could, in many cases of cavernous phthisis, produce a marked improvement, and the experiments of Forlanini, Murphy, Lemke,[24] in America, as well as Tuffier[25] in France and Brauer in Germany, with production of an artificial pneumothorax have shown that the compression of the diseased lung causes collapse of abscess cavities, arresting respiratory function and furthers cicatrization, and in consequence the lymphatic circulation is retarded and the absorption of toxic material from the diseased organ reduced. This effect is clinically evident in the cases thus treated, by a reduction of fever, cessation of cough and improvement in the general condition.

I am satisfied that this principle of immobilization of the lung is correct, and am certain that in working out some method which would facilitate its application without causing the great mortality or deformity of the present methods lies a promising field in the treatment of unilateral tuberculosis.

To exploit this valuable principle of lung collapse, and to perfect its means of application, has been my aim, but my experiments in this particular field are too recent and incomplete to permit their publication, although they seem very encouraging.

TREATMENT BY INJECTIONS OF VASELIN PASTE

At this point I desire to discuss the treatment of empyema and lung abscess, which, in a measure, led to my experiments in the treatment of tuberculous pleurisy.

During the past two years my brother, Dr. Carl Beck, and I have had considerable experience in the treatment of empyema by means of injections into the cavities of a liquefied paste made of 33 per cent. bismuth subnitrate and 67 per cent. of vaselin.[26]

The subject has, in connection with the treatment of chronic sinuses and suppurative conditions of the nasal accessory sinuses,[27] aroused considerable interest in the medical profession, since its simplicity and efficiency seem to have rendered it a valuable addition to our present methods of treatment of this class of chronic suppurative diseases.

In this paper I shall omit a review of the literature on the treatment of empyema, knowing that the medical profession is familiar with the methods in vogue; I shall confine myself to the consideration of this one method of treatment, which I first introduced in 1907, and to its further development since that time.

In December, 1907, I instituted this form of treatment in the first case, an abstract of the history of which is here cited:

CASE 1.—*Empyema.*—Patient, H. A., aged 19. Family and personal history free from tuberculosis. January, 1907, an attack of pleurisy with effusion, soon changed into empyema. March 20, 1907: Resection of two ribs, evacuation of pus, drainage. A daily discharge of 2 to 3 ounces of fetid, green pus persisted in spite of all treatment until Dec. 20, 1907, when the patient was brought to me for treatment.

Bismuth Treatment.—Drainage-tube was removed and 120 gm. of bismuth-vaselin paste were injected into the suppurating cavity in the patient's chest. Two days later the injection was repeated, most of the previously injected paste having escaped with the discharging pus.

Later History.—After four days the discharge became serous, lost its foul odor and greatly diminished in quantity. Injections were repeated daily for a few days, and on the twelfth day the sinus closed and has remained so to date; the patient has gained 30 pounds and is in perfect health. Skiagraphs had been taken at intervals of two months which demonstrated

15. Forlanini: Deutsch. med. Wchnschr., 1906, No. 35; referring to previous work.
16. Murphy, J. B.: Surgery of the Lung, THE JOURNAL A. M. A., 1898, xxxi, 151, 208, 281, 341.
17. Brauer: Die Behandlung der einseitigen Lungenphthise mit künstlichem Pneumothorax, München. med. Wchnschr., 1906, No. 7.
18. Lexer, Carl: Therapeutische Versuche mit. künstliche Pneumothorax, Beitr. z. Klin. d. Tuberc., 1907, viii, 101.
19. Schmidt, A.: Deutsch. med. Wchnschr., 1906, No. 13.
20. Brauer: Lungencollapse-Therapie, Beitr. z. Klin. d. Tuberc., xii, 49.
21. Friedrich: Lungen-Chirurgie, München. med. Wchnschr., Dec. 1, 1908.
22. Spengler, Carl: Thoracoplastic und Höhlendisinfection bei Lungenphthise, Deutsch. med. Wchnschr., 1903, xxix, 312; Zur Chirurgie des Pneumothorax, Beitr. z. klin. Chir., 1906, xlix.
23. Baumler: Abhandlungen über tuberk. Empyema, Deutsch. med. Wchnschr., Sept. 13, 1894, p. 717.
24. Lemke, A. F.: Discussion on his paper on Pulmonary Tuberculosis, THE JOURNAL A. M. A., 1899, xxxiii, 1085.
25. Tuffier: Ref. by Musgrave, Inter. Med. Congress, Moscow, 1897.
26. Beck, E. G.: Fistulous Tracts, Tuberculous Sinuses and Abscess Cavities: A New Method of Diagnosis and Treatment by Bismuth Paste, THE JOURNAL A. M. A., March 14, 1908, L, 868.
27. Beck, J. C.: Bismuth Paste in the Treatment of Suppuration of the Ear, Nose and Throat, THE JOURNAL A. M. A., Jan. 9, 1909, lii, 117.

the gradual absorption of the bismuth paste and the slow expansion of the lung where the abscess had existed.

This surprising result led me, and others also, to the further application of this simple method of treating such complicated and usually unfavorable cases, and six months later I was able to include in my report to the Sixth International Congress on Tuberculosis[28] 19 cases in which empyema and lung abscesses were treated by this method; 14 of the patients were then apparently cured, 4 improved and still under treatment, and one not improved, having discontinued treatment.

The sources of this report were quite reliable, such competent surgeons as Mayo, Ochsner, McGuire, etc., contributing to same in addition to the cases treated by myself.

Since the publication of these cases reports from many surgeons throughout this country and from abroad have convinced me that the application of the bismuth paste in the treatment of empyema surpasses even the good results obtained in treating other suppurative conditions by the bismuth paste method.

Nemanoff,[29] for instance, reports 4 cases of empyema treated in Professor Kadjan's clinic, St. Petersburg, in which one injection of the bismuth paste in each case was sufficient to produce complete closure, whereas the same patients had been treated at the clinic for six months without success. Eighty grams of the paste was the maximum dose.

Dr. A. J. Ochsner,[30] Chicago, reported to the American Surgical Association June 4, 1909, 14 cases of empyema, in all of which operation had been previously performed and the sinus failed to close, although in two of them the Estlander operation had been performed. In all these cases he applied the bismuth paste, with the result that twelve cases had completely healed and two patients are still under treatment and very much improved.

My experience and that of Dr. Carl Beck disposed of 10 cases of empyema and three cases of lung abscesses.

How many of these cases were of tuberculous origin it is difficult to say. In two of them we could positively prove the tuberculous nature, having found the bacilli in the discharge, and also proved its existence by animal inoculation.

Cases 1 to 9 inclusive were treated according to the method described in my previous publication. In the last four cases, 10 to 13 inclusive, important modifications were made, which may lead to entirely new and valuable improvement in the surgical treatment of empyema and lung abscess.

I shall briefly cite the histories of these thirteen cases, since nearly each one brings out some points, knowledge of which will be of value in the future treatment of similar cases.

Cases 2 and 3 are cited in detail elsewhere,[28] and I shall not give detailed histories of them in this paper.

CASE 2.—*Tuberculous Empyema.*—Patient was a young lawyer. Repeated withdrawals of pleuritic fluid in 1906 were followed by empyema. The same year five ribs were resected but the cavity did not collapse and discharged 100 c.c. of green pus every day.

Bismuth Treatment.—In April, 1908, the cavity was injected with 720 grams of bismuth paste, which was allowed to remain six weeks. At first the patient gained in weight, but at the end of six weeks he developed symptoms of bismuth intoxication, starting with slight cyanosis, then blue borders on his gums, loss of weight one pound a day and desquamative nephritis. As soon as the cause of these symptoms were explained the cavity was immediately filled with 500 c.c. warm sterile olive oil, which formed an emulsion with the paste, and was easily withdrawn the next day by means of a suction pump.

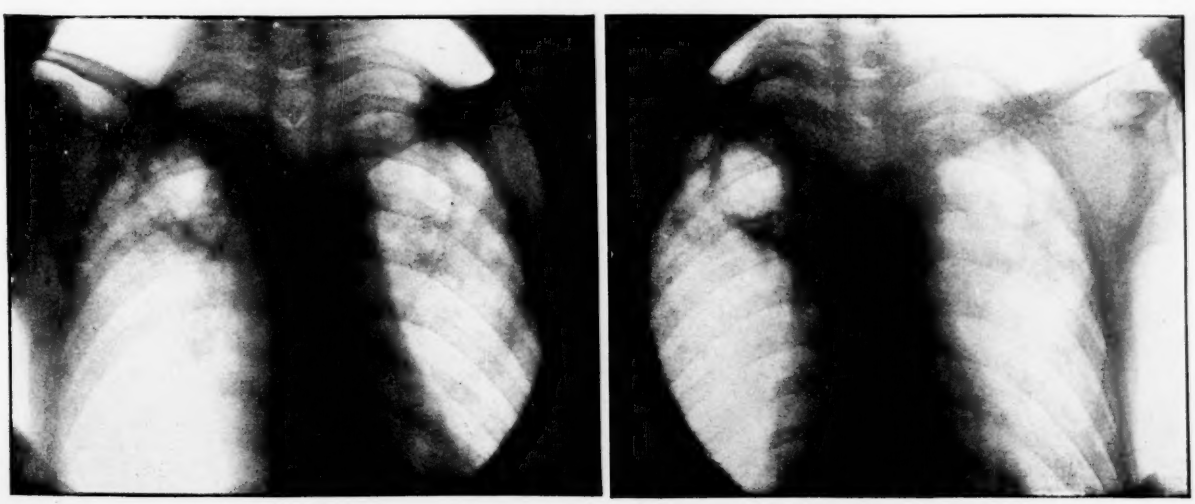
Later History.—All symptoms of intoxication disappeared in one week and patient regained his weight at the same rate that he had lost it. The pus became seropurulent and continued to discharge in quantities of one to two ounces a day until December, 1908, when the sinus closed and remained so until March, 1909, when it reopened and a quantity of green pus escaped, which, on examination, was found to be sterile. The cavity was refilled with pure, sterile petrolatum. It closed the following day and has remained closed to date. The final result of this case is not as yet decided, although the patient considers himself perfectly well and has chosen the occupation of chauffeur.

CASE 3.—*Lung Abscess.*—The report of this case, which is similar to Case 2, is given in full in the Transactions of the Sixth International Congress on Tuberculosis.

Both Cases 2 and 3 proved to be of tuberculous origin and in both the bacteriologic studies of the secretions, as well as tests by animal inoculation, proved that within the first six weeks of treatment with bismuth

28. Beck, E. G.: Tr. Sixth Internat. Cong. on Tuberculosis, 1908.
29. Nemanoff: The Treatment of Fistula and Drainage Passages, Russk. Vrach, vii, 1568.
30. Ann. Surgery, July, 1909, p. 151.

Fig. 1.—Stereoscopic view of active tuberculosis with cavity formation.
The stereoscopic views are placed at the margin to facilitate the use of the stereoscope.



paste the tubercle bacilli, as well as other micro-organisms, gradually diminished and finally disappeared. Ten c.c. of the secretions injected into the peritoneum of a guinea-pig did not produce tuberculosis or septic infection, while previous to the bismuth treatment one drop of the pus of each of these cases injected into guinea-pigs produced a tuberculosis within four weeks.

CASE 4.—*Empyema.*—Chas. L., aged 18, had the grip in March, 1908; two weeks later developed pleurisy with effusion. Temperature 105. Aspiration was not performed until four weeks later, when resection of a rib was done and 2,000 c.c. of pus evacuated and drainage established. For three and a half months the pus continued to discharge profusely. July 20 30 gm. of bismuth paste were injected, whereupon the secretion ceased within twenty-four hours and sinus closed five days later. Patient gradually regained his health and sinus has not reopened.

CASE 5.—*Empyema.*—M. O., aged 48, electrician, in 1906 developed an empyema, which, after resection of two ribs and drainage, failed to close. A radical operation was performed sixteen months later by resection of three more ribs, but even this was in vain, and bismuth injections were tried by his physician, and as these also were ineffective, the latter referred the patient to me for treatment. I saw him first on Aug. 2, 1908, with a sinus beneath the right scapula leading into a large cavity from which a seropurulent discharge of a sour, fetid odor escaped, causing severe eczema around the mouth of the sinus. After ten injections of the bismuth paste at intervals of three days the condition was no better. I then tried an injection of the paste to which 2 per cent. formalin had been added. This caused severe pain and the condition seemed aggravated. Patient discontinued treatment and came under the care of another physician, who recently reported to me that another radical operation had since been performed with the object of producing lung collapse, but patient did not rally and died shortly after the operation.

CASE 6.—*Empyema.*—Mary H., 8 years old, had at the age of 6, developed empyema which, after several months of expectant medical treatment, ruptured spontaneously in two regions on the anterior left chest wall, leaving three sinuses discharging green, thick pus. Child was very much emaciated when brought to me in May, 1908; fever varied from 101 to 102 daily. Patient coughed and had shortness in respiration (20 to 42). There was dulness on the entire left chest, radiograph showing distinctly that side filled with fluid. Instead of the usual resection of ribs and drainage, I injected 60 grams of the bismuth paste through one of the sinuses. Temperature and cough persisted in a milder form for a period of three weeks; thereafter all symptoms disappeared and all three sinuses closed. While I could ascertain the presence of fluid in the pleura three months later the child had, nevertheless, gained 20 pounds in weight and is at present in perfect health, the fluid having been in the meantime entirely absorbed.

Bacteriologic examination of pus, carried out systematically, proved that the pus discharge became sterile twenty days after first injection.

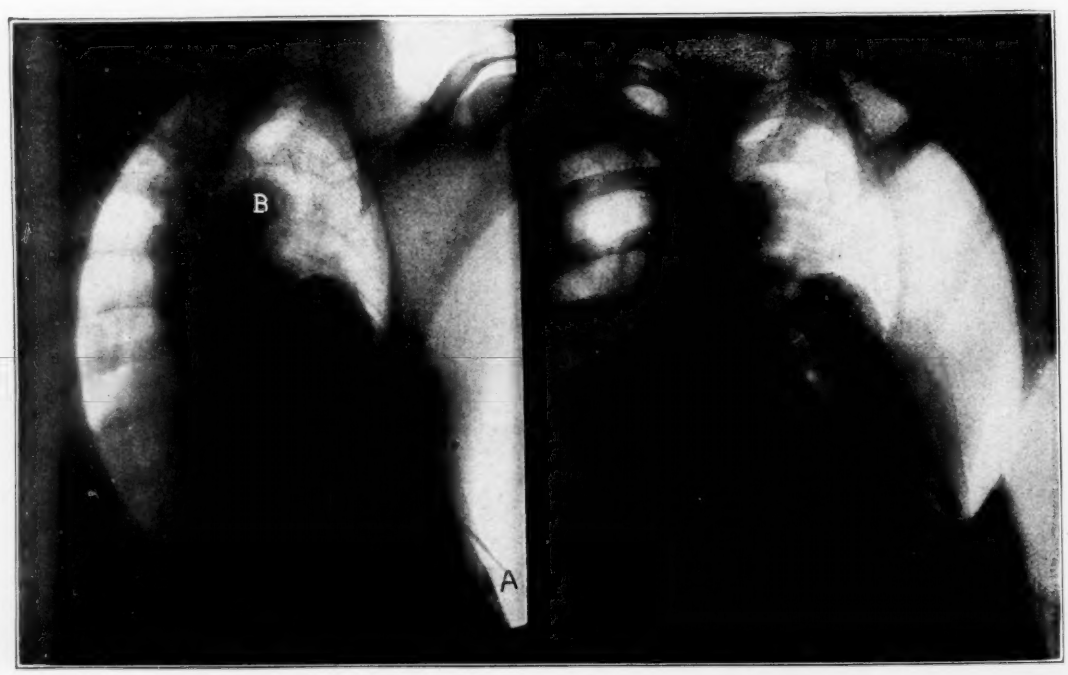
CASE 7.—*Empyema.*—Miriam D., aged 5½ years, a delicate child, was taken sick at the age of 3 with acute lobar pneumonia. Empyema followed, and after the withdrawal of some of the fluid a resection of two ribs was performed by a surgeon in Ohio. In spite of perfect drainage and careful medical treatment the empyema continued discharging pus for one and one-half years, child failing gradually in health. As a last resort an Estlander operation was advised by the physician in charge, which the parents refused. In October, 1908, the child was brought to me for treatment. Her temperature varied from 99 to 101. Extreme emaciation and cough with pain as well as retraction of chest wall, were the principal symptoms. The small contracted opening into the chest secreted about 30 gm. of creamy pus daily. Through this sinus I injected 30 gm. of bismuth paste and took a radiograph, which showed that the cavity contained a large quantity of pus and the paste merely floated therein. Without resorting to further injections I observed the case for two weeks and noted a gradual decrease in the fever and cough, cessation of the discharge and closure of the sinus on tenth day. The child gained four pounds during the two weeks and the latest reports indicate that she has regained perfect health. (This patient was presented at the session of the American Medical Association, Atlantic City, June, 1909.)

The lesson learned from Cases 6 and 7 is the following:

1. It was not necessary to evacuate or drain off the pus from the pleural cavity before injecting the bismuth paste, and small quantities (30 to 60 gm.) were sufficient to produce the desired results.

2. Although the purulent exudate was not absorbed for several weeks after the bismuth injections had been

Fig. 2.—Stereoscopic view of sinus from empyema of twenty-eight years' standing, filled with bismuth paste (Case 9) closed in sixty days after first injection. A indicates rubber drain; B, arch of aorta.



made, its presence caused no elevation of temperature and sinuses closed in a comparatively short time.

3. While the discharge retained its purulent character after the bismuth injections, it was nevertheless found to be sterile.

Through the courtesy of Dr. W. C. Kirchner, surgeon-in-charge of the St. Louis City Hospital, who placed at my disposal a number of patients for demonstration of the bismuth paste treatment of sinuses before the members of the St. Louis Surgical Society, I injected, among other cases, one of empyema which I desire to include in this series. Dr. Kirchner's history of the case follows:

CASE 8.—*Empyema.*—Boy, aged 8, entered City Hospital, March 19, 1909, with a tentative diagnosis of appendicitis. Pulse, 140; respiration, 44; temperature, 101.6. After a few days of observation diagnosis of bronchopneumonia with pneumothorax was made.

Bismuth Treatment.—Temperature became normal three days after operation; discharge diminished but was very offensive under daily dressing until April 25, when patient was taken to clinic and 120 gm. of 33 per cent. bismuth paste, Formula 1, were injected into the pleura by Dr. E. Beck of Chicago. A second injection was given April 30 and on May 25 sinus was entirely closed and patient apparently cured.

Smear preparation of pus and the sputum were negative as to tubercle bacilli.

CASE 9.—*Empyema.*—G. T., aged 39, engineer, family history negative, had measles at the age of 15; no other disease. In 1881 he suffered from an attack of pneumonia, followed by accumulation of pus in the left pleura. Drainage was established by intercostal incision (Dr. Favill, Sr., Madison, Wis.) and rubber tubing inserted. The purulent discharge had persisted since 1881 and with only a few days intermission, a drainage tube had to be kept in the discharging sinus. Various methods, except radical operation, were tried in attempts to close the sinus, but all failed. In January, 1909, the patient was referred to me by Dr. H. B. Favill for treatment. His general health was very good, temperature and pulse normal, right lung normal, left lung and chest cavity very much retracted. Pus discharge of thick and of dark green color, contained staphylococci and a few streptococci.

Bismuth Treatment.—Injection of bismuth paste, Formula 1, 60 gm., filled out the entire contracted pleural sac. Temperature remained normal and discharge became serious on fifth day. Injections were repeated every third or fourth day, and after sixty days the sinus closed and patient returned to Arizona to resume his work.

This case is very instructive, since it teaches that even after twenty-eight years' constant suppuration an empyema may be obliterated by injection of the paste. The stereoradiograph (Fig. 2) of this case demonstrates distinctly in plastic effect the size and contour of the remaining pouch and likewise illustrates the efforts of Nature in her attempt to obliterate this cavity during the twenty-eight years. The ribs were so retracted that the intercostal spaces disappeared, the spinal column curved with its convexity to the well side, clavicle drawn down and diaphragm drawn up, all structures contracting toward one center, the old suppurating cavity.

The following case illustrates a new method of treatment of lung abscess, and for that reason I will give a more detailed history.

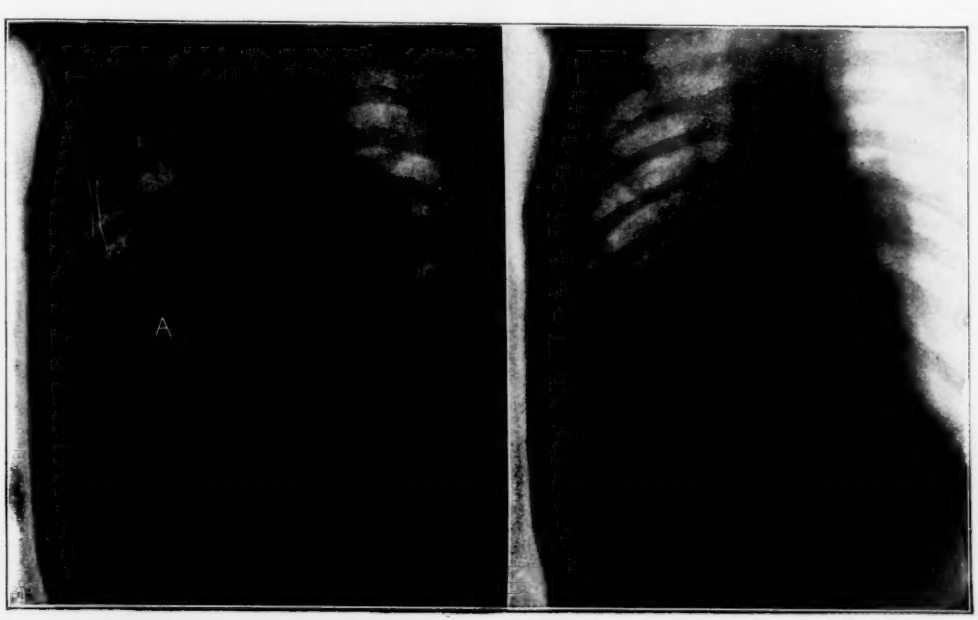
CASE 10.—*Abscess of Lung.*—Ellsworth D., aged 15, family history negative as to tuberculosis, was well until four years before examination, when he inhaled a brass pin-tack, the size of a lentil. Within a week he developed pneumonia. While the acute symptoms passed, he continued to expectorate pus and had a daily elevation of temperature from one-half to 3 degrees. In spite of all medical and climatic treatment, the above symptoms persisted for four years.

Examiantion.—I first saw him Dec. 15, 1908. His weight was 98 pounds, temperature 97, pulse 120, cyanotic and greatly distressed. The entire chest was resonant, except the right posterior and lower part, the dulness extending upward to the angle of the scapula. Stereoradiographs were taken (Fig. 3), which were of great assistance in the anatomic diagnosis, since they brought out, in plastic effect, the location of the abscess and its relation to the other structures, and show the foreign body. The expectoration had a fetid odor, was green in color, and at each coughing spell at least half an ounce of pus was expelled. The microscopic examination of the pus revealed the presence of streptococci, pneumococci and staphylococci. Cultures produced an abundant growth of streptococci.

An operation was decided on and a modified method of treating abscess of lung employed in this case as stated above.

Operation and Bismuth Treatment.—With the usual preliminary preparation for rib resection, the patient was chloroformed and under the guidance of the stereoradiograph an incision 10 cm. in length was made, directly over the region of the abscess, i. e., about 5 cm. below the angle of the scapula. Resection of 4 cm. each of seventh and eighth rib was made without opening the pleural cavity. Two catgut stitches were inserted by means of a curved needle, fastening the visceral pleura to the chest wall. Packing sterile gauze against the exposed parietal pleura, temporary sutures in the skin were inserted and the patient put to bed. On the third day another short chloroform anesthetic was given, the gauze packing removed, an incision of one inch made in the pleura, and, with the index finger the lung tissue was bored through until the

Fig. 3.—Stereoscopic view of lung abscess, treated by prophylactic bismuth paste method, closed in ten days. A indicates abscess before operation



resistance indicated that the abscess wall had been reached. A pair of blunt, curved artery forceps were passed along the index-finger, pushed into the abscess and the cavity widely spread apart. About 100 gm. of a very offensive pus escaped. The hemorrhage was very slight. Five strips of gauze 2 inches in width were packed into the cavity, the ends of same being tied on the outside with a silk ligature. Patient's temperature, cyanosis and cough still continued. The following day the five strips of gauze were removed and the cavity injected with 100 gm. of 33 per cent. bismuth-vaselin paste. This produced a coughing spell, the patient expectorating a great deal of pus, mixed with the paste. No drainage-tube was inserted into the pleural opening. The injections were repeated daily for one week, and each time the patient emptied the contents of the abscess by coughing out some pus mixed with the yellow paste. At the end of ten days the external wound was entirely closed, symptoms of cough, fever and cyanosis disappeared.

Later History.—Four days after operation patient was sufficiently well to permit of my presenting him before the North Side Branch of the Chicago Medical Society and later at the Milwaukee Medical Society. His general condition now is excellent, his weight having increased from 98 to 124 pounds, and temperature has remained normal since one week subsequent to the operation.

It is not advisable to inject the paste while the patient is under anesthetic, since the pus may be drawn into the trachea and cause aspiration into the other lung.

While I have had opportunity to carry out this method of treating lung abscess in this one case only, the result is so striking and theoretically so plausible that I do not hesitate to recommend this procedure, in suitable cases, to anyone who is familiar with surgery of the chest.

CASE 11.—*Empyema.*—Harold B., aged 8. Family history negative. Measles at 2 years of age. March 28, 1909, present illness began with high fever; diagnosis, lobar pneumonia. Patient not recovering as expected, physician brought him to the hospital April 9.

Physical examination revealed dulness over the entire right chest; left normal; radiograph (Fig. 4) corroborated physical findings. Temperature 100, pulse 120, respiration 32, marked cyanosis and emaciation were the cardinal symptoms.

Operation and Bismuth Treatment.—Operation April 11 by Dr. Carl Beck, consisting of the resection of one inch of the seventh rib. Rubber drain inserted after 350 c.c. of pus escaped. Pus continued to discharge and on the fourth day the rubber drain was removed and 100 grams of a 5 per cent. bismuth-vaselin paste (bismuth subnitrate 5 per cent., vaselin 95 per cent.) were injected into the cavity and a plain sterile gauze dressing applied. On the following day temperature became normal and all previous symptoms were ameliorated. Injection was repeated and six days later the secretion ceased. Sinus closed on the eleventh day after operation and has remained so to date.

Bacteriologic findings before bismuth injection had, as usual, been made, the smear preparation showing an abundance of staphylococci, and, in the culture media, a growth of staphylococci and Friedlander bacillus. Following the first injection a slow growth could be produced. After the second injection we could not produce any growth at all.

CASE 12.—*Empyema.*—M., 2 years old, had a severe attack of pneumonia April 16, 1909, starting with a temperature of 105.8, pulse 136, respiration 48, which, after ten days developed into an empyema of the entire left chest. Resection of one rib by Dr. Carl Beck with introduction of drainage-tube produced only moderate relief. Temperature still ranged from 100 to 102 and respiration from 38 to 48 during the entire week following the operation.

Bismuth Treatment.—On the eighth day after operation (May 3, 1909), an injection of 120 c.c. of a 5 per cent. bismuth-vaselin paste was made, and two days later the same quantity reinjected. Temperature fell to 99.4 (rectal), respiration to 30 within four days, and subsequently became normal, respiration 30. The pus became sterile after the first bismuth injection, but staphylococci reappeared a week later, and for this reason the opening has not been allowed to close. The injections will be continued until the secretion becomes sterile and then the closure of sinus permitted.

The general condition has markedly improved, cough disappeared, no signs of bismuth absorption present.

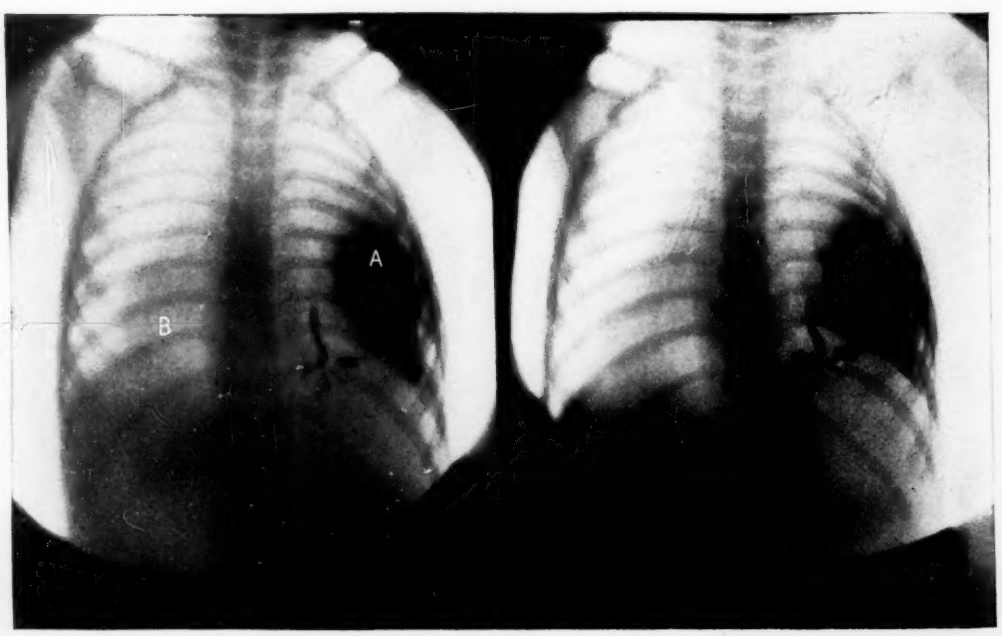
In the treatment of Cases 11 and 12 we deviated from the usual procedure in such cases in that the drainage tube was removed as early as the fourth day after operation and the cavities filled with a 5 per cent. bismuth paste instead of waiting several weeks for Nature to close it.

While the clinical results in these two cases are satisfactory and that complications need not be anticipated, nevertheless I do not, as yet, advocate this method as a routine procedure until a larger series of cases has proven its advantage over the present methods.

At any rate, anyone wishing to try this innovation should do so under careful guidance of daily microscopic examination of the secreted pus, and as long as the pus contains micro-organisms the opening should not be allowed to close.

CASE 13.—*Empyema.*—G. E., aged 26, with negative history of tuberculosis, was attacked with a severe type of pneumonia March, 1909. Severe cough, high temperature, lasted for ten days, and instead of usual crisis the patient continued to have fever, from 100 to 103 daily.

Fig. 4.—Stereoscopic view of empyema filled with bismuth paste four days after operation; healed in two weeks. A indicates 5 per cent. bismuth paste; B, heart dulness.



Shortness of breath increased and he lost considerably in weight. In this condition, with a temperature of 103, rapid pulse and labored breathing, he came to the city May 15, 1909,and applied to Dr. Wynekoop for treatment, who called me in consultation. Diagnosis of empyema, based on all typical symptoms, was soon reached, and, moreover, corroborated by a stereoradiograph and thoracentesis, whereon an operation was proposed.

Operation and Bismuth Treatment.—On my suggestion the following procedure was employed in this case: May 16, 1909, under anesthetic, a resection of one rib was made and two quarts of thick, greenish, yellow pus were evacuated. Instead of inserting a rubber tube, a quantity of 250 c.c. of 5 per cent. bismuth vaselin paste was at once injected and a plain sterile gauze dressing placed against the incision.

Later History.—Temperature, pulse and respiration became normal within twenty-four hours after operation and remained so to date (May 27). Patient is gaining in weight and strength, eats with great relish and has no difficulty in breathing. The purulent secretion changed into a seropurulent within twenty-four hours, and at the end of the first week only a small quantity of sterile serous discharge escaped into the dressing. At present (two weeks after operation) only a little vaselin escapes from the contracted small opening.

The procedure employed in this case would certainly be an ideal method if we were certain to obtain in every case the same favorable result. One case, however, no matter how brilliant the result may be, is not conclusive, and here, as in Cases 11 and 12, we must produce a large series of similar results before we can safely advocate this procedure as a routine method in treating empyema.

In reviewing the histories of these thirteen cases one can follow the step-like development and the gradual approach to what we aim to make a satisfactory method of treating empyema; a method which would do away with the rubber drain, the everlasting daily dressing, the continued suppuration which causes the pleura to become so much thickened that the expansion of the lung is practically impossible; a method which would cast into eternal oblivion the necessity for such radical, deforming and dangerous operation as the resection of the chest wall.

The factors contributing to the efficacy of this method of treatment of chronic suppurative diseases have been studied by me and published in the "Transactions of the Sixth International Congress on Tuberculosis" and my conclusions since that time have not changed materially.

Further investigations in the pathology and reparative processes are being carried on by my brother, Dr. Carl Beck, and will be published in due time.

CAUSES EFFECTING HEALING PROCESS

1. Bismuth-vaselin paste (proportion one part bismuth and two parts vaselin), when injected into suppurative cavities or sinuses, produces chemotaxis. In other words, it attracts the leucocytes to the parts injected, where the phagocytic action destroys the bacteria present in the walls and channels of the sinuses. A systematic examination of the secretions by smear and preparation, cultures, and frequently by animal inoculation before and after the injections of the paste, have proved to me the bactericidal action of the bismuth subnitrate when brought in contact with living tissues. Tubercle bacilli are no exception, this fact having been discovered in Case 2 and corroborated in Case 3. They are rarely found in the pus from tuberculous sinuses; more often, however, in tuberculous empyema. They lodge in the granulations and walls of abscess cavities. The bismuth paste, coming in contact with the walls containing the bacilli, induces chemotaxis, and the leucocytes thus drawn to the injected region destroy the micro-organisms present. This, to a certain degree, explains the interesting microscopic findings of the morphologic changes and destruction of the bacilli.

2. The chemical action of the bismuth subnitrate in the destruction of the micro-organisms seems to be very slight, as shown by experiments on cultures *in vitro*.

3. Distention of the abscess cavities with the paste and pressure can play only a subordinate part in the therapeutic effect. In some of these empyemas (Cases 6 and 7) only a small quantity was injected into a large cavity containing quantities of pus, and the results were all that could be desired.

4. The exposure of the injected parts to the *x*-ray can, likewise, play only a secondary part in the healing process, as I have received reports from many surgeons who obtained satisfactory results without the use of the *x*-ray. I believe, however, that in tuberculous sinuses from joint disease the application of the *x*-ray often accelerates the healing.

TECHNIC IN CHEST CASES

The technic of bismuth injections employed in abscess cavities in the chest differs somewhat from the one applied in sinuses. In the chest we have to deal with an infected cavity which has a rigid chest wall on one side, and the retracted, but more or less resilient, lung on the other. It is generally believed that if the air could be prevented from rushing into the cavity with each inspiration the lung would expand and fill up the space, but this does not explain why in many cases the abscesses do not heal when this principle is carried out by the suction-pump of Perthes,[31] and in recent tuberculous cases it is not even desirable.

After a radiograph of the cavity has been taken and an examination of the secretion has been made, it is injected with 100 gm. of bismuth paste, Formula 1. Gauze dressings are applied daily until sinus closes. Should temperature rise above 101 F., or the patient complain of severe pressure, the accumulated fluid should be drained off and the opening again allowed to close. If the temperature remains normal and no unpleasant symptoms arise the 100 gm. of paste injected may be left in for absorption, provided no signs of bismuth intoxication arise. Repetition of the injection is necessary only when the bismuth paste has discharged with the pus, and micro-organisms are still found in the secretions. In my early experience I supposed that the cavity had to be overdistended with the paste in order to produce healing, and I introduced as much as the cavity would hold. Such large quantities are not only unnecessary but are also liable to produce bismuth intoxication. Should any signs of this poisoning appear the bismuth must at once be dissolved by warm olive-oil and withdrawn by suction-pump.

It is noteworthy that the tuberculous empyema is far more resistant to any form of treatment than that of pneumococcus or other varieties. Murphy states that a very large percentage of empyema in adults is of the tuberculous form and that these rarely undergo absorption or break into a bronchus.

From personal communication with Dr. Moore, medical superintendent of the Dunning Hospital for Consumptives, an institution which takes care of an average of 400 patients in the progressive stages, I have the information that in the past four years he observed, in 5,000 cases treated, 25 cases of tuberculous empyema,

31. Perthes: Mitt. a. d. Grenzgeb. d. Med. u. Chir., vii, Heft 4, 5.

and, whether operated on or not, all of the patients succumbed to the original disease.

These tuberculous empyemas are usually preceded by the serofibrinous pleurisy, which, either by frequent tapping or spontaneously, become secondarily infected. Operation is usually resorted to and, as a rule, the subsequent treatment is very tedious and unsatisfactory.

In my series of cases two were proved to be of tuberculous variety, and, while I do not consider the patients perfectly cured, they have so much improved as to permit the resumption of their pursuits in life, one of them having conducted his own campaign for state's attorney and won in the battle, the other taking a position as chauffeur.

Empyemas in children, or those following acute inflammatory condition in adults, give a very much brighter outlook for recovery. In children the drainage is usually rapidly followed by expansion of the lung and spontaneous closure of the sinus, and the majority of cases of the non-tuberculous type in adults will yield to the accepted methods of surgical treatment. A small percentage of cases, however, even of these types, will resist all medical and surgical treatment, and the sinuses keep on discharging pus indefinitely.

The failures are thus explained:

1. As long as the walls lining the pleural cavity are the seat of living micro-organisms, especially tubercle bacilli, an obliteration of the space can not be expected.

2. After suppuration has existed for years and the pleura has become very thick and the lung cicatrized, the expansion of the lung will not be possible.

The requirements therefore are:

A cavity free from micro-organisms and the lung still sufficiently resilient for expansion.

The method here described and employed in the cases enumerated, I believe, possesses to a marked degree the means essential to obliteration of abscess cavities. The introduction of bismuth paste has, as a rule, produced, by a process of local leucocytosis, a sterilization of the secretion, and in most cases softened the indurated pleura sufficiently to allow moderate expansion of the lung and obliteration of the space.

I realize that a series of thirteen cases is too small and the time since the application of this new method too short to admit of formulating fast rules. My aim in thus prematurely bringing the subject before the profession, is to stimulate others to help in working out an ideal method of treating lung abscesses and empyema.

92 State Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. POWERS, BECK, FRIEDRICH, MEYER, AND GREEN AND JANEWAY—A SYMPOSIUM ON THORACIC SURGERY *

DR. DEFOREST WILLARD, Philadelphia: We all know the difficulties of thoracic surgery. We have invaded the abdomen and cranial cavity with comparative impunity and safety. Why? Because the cranial and abdominal cavities contain organs which are not essential to immediate life; but in the thorax are located the lungs and heart, without which no person can live more than a few moments, while the abdominal organs can be incapacitated for work for a long period of time. Therefore, we have approached this region with fear and trepidation. Since the invention of cabinets for positive and negative pressure, and for producing differential pressure, the thorax has become a more hopeful field for the surgeon, and we may yet hope in due time to meet the difficulties now before us with better preparation than heretofore, especially in cases of sudden pneumothorax, which have always been a *bête noir* in surgery. To treat a diseased lung is not so difficult, because it is crippled already, and it is not nearly so dangerous as is an acute pneumothorax. For many years I have been much interested in chest surgery. It has been my hope that we might be able to treat a tuberculous cavity in the lung by opening and drainage. The experiments I performed twenty years ago on dogs and experience since that time on human beings, has convinced me that if there were a single apex cavity it would be a feasible and successful operation, but, unfortunately, in tuberculosis of the lung, there is not, as a rule, a single cavity, but many cavities scattered throughout the lung, and while we could open and drain one, others would remain. In the experiments I performed many years ago, I found great difficulty in preventing leakage from the bronchial tube into the pleural cavity. If I closed the external opening through the walls, speedy death would be the result from this constant leakage of air. The method described by Meyer of crushing the bronchus will certainly be an advantage in preventing such an accident, especially when the bronchus is ligated and sutured afterward. In extirpation and pneumectomy, I am sure that the methods he described will be perfectly possible by means of differential pressure. The size of the opening in the chest wall is also a factor in determining the occurrence of pneumothorax. If we can establish tolerance by means of partial closure, we have gained much. In regard to mediastinal work, the transverse opening employed by Friedrich is by far the most advantageous, and is much better than the vertical incision. Judging from the benefits I have derived in surgery from the use of bismuth paste, in empyema, I feel satisfied that its influence on the diseased pleura will be useful. I am much pleased with Dr. Meyer's aëronautic invention, and we may hope that by means of this and the aëroplane, surgeons will in the future be able to take their patients up into the air a few thousand feet and operate, free from the dirt and dust of the street.

DR. S. J. MELTZER, New York: The statement frequently made by the followers of the Brauer method, that there is no functional difference between this method and that of Sauerbruch, physiologically, is incorrect. While under the Sauerbruch method the expiration does not differ from that which takes place under normal conditions, the expiration under the Brauer method, that is, the removal of the carbon dioxid, has to take place against the atmospheric pressure plus a pressure of 8 or 10 millimeters of mercury. That is the reason why in operations under overpressure the blood often looks dark.

The slowing of the heart which occurs under distention of the lungs leads to actual stoppage of the heart. This is either a reflex act or is due to a stimulation of the vagus centers in the medulla, by the carbon dioxid. At any rate, it is important to know that the grave situation can be easily relieved by an intravenous injection of atropin. I wish also to refer briefly to a physiologic observation we made in the laboratory at the Rockefeller Institute which promises, we believe, to be of considerable practical importance. We found that under a certain method of insufflation of air, the animal does not require any respiratory movements of its own to maintain its life. In under-pressure or over-pressure, the methods are employed, it is assumed, only to prevent the collapse of the lungs while the respiration is carried on by the animal itself. This assumption, we found, is well founded. If curare is given to an animal breathing under the Brauer method, the animal dies in a few minutes. By our method the animal may be completely curarised and will continue to live for many hours. The method consists in introducing a tube into the trachea as far down as the bifurcation and conducting a continuous stream of air under a pressure of from 10 to 15 millimeters of mercury through this tube. The removal of the air carrying the carbon dioxid takes place through the space between the tube and tracheal wall driven by this pressure instead of against it.

DR. G. E. FELL, Buffalo, N. Y.: It is natural from the work I did a score of years past that I should be greatly interested in this subject. My apparatus with which I have

* The papers of Drs. Friedrich, Meyer, and Janeway and Green appeared in THE JOURNAL last week.

resuscitated many human beings, who have stopped breathing, is exceedingly simple after it has been studied. With it one may keep up respiration by rhythmically pressing on the piston of the air-valve, making the intervals as long or as short as is desired. In the final closure of the chest cavity, the entire pleural space of the thorax is filled with the lungs by pressing down, the piston keeping up a continuous inflation within reason, holding it as long as desired; the chest cavity is closed air tight, and autorespiration should ensue, all other matters being satisfactory. I believe that positive pressure is the best when properly applied. It is unquestionably too valuable to be pushed aside, and will be utilized on account of its portability much more than the cabinet method. In thoracic surgery, it will permit absolute control of the lung movements, or of inspiration or expiration, the latter being really passive. This was practically proved by the work I did in 1887-1888, and the following decade, the real discovery of practical forced, instrumental respiration on man. The method of using the anesthetic and oxygen with this apparatus is practical and the quantity can be gauged to a nicety. No other apparatus I have heard of compares with it in this respect, and in every other application it has proved its actual value as a means of respiring for human beings. If, as has been done in my experience, we can breathe for a human being for three or four days and nights, and save life, we should be enabled to keep up respiration for surgical purposes at the most when only an hour or so would be required. My demonstrations of its value have been varied, and it has been described here and there in my writings, although then it was not so complete as now. Notwithstanding this, it has not been fully understood by those who have discredited it.

DR. SAMUEL ROBINSON, Boston: At the end of two and a half years of experimental surgery, it has been my good fortune within the last three months to visit Marburg, Germany, and I would express my thanks to Professor Friedrich for his courtesy in allowing me to work with Professor Sauerbruch in his clinic. During the last three years I have performed animal operations under positive and negative pressure. I have operated on human beings with positive pressure and have witnessed operations on human beings under negative pressure. I think that I have seen most of the apparatus in this country and in Germany, which are indeed many. The question in the minds of many surgeons to-day is: "Shall I employ pressure difference in my operations on the thorax or not?" Nothing would be more contributory to the solution of the problem than to have a number of surgeons operate on all individuals who present themselves with thoracic disturbances without pressure difference. If any man is convinced that pressure difference is unnecessary and will operate on every one with the same courage with which surgeons are now operating under pressure difference, his results will be the greatest contribution to this branch of surgery. Knowing the accidents that may happen, I personally am not ready to take such risks. To those who have concluded that pressure difference should at least be available in thoracic operations, the question that arises is: Is positive or negative pressure to be preferred? I urge you not to lose unnecessary time in this choice of methods. German physiologists have shown that the negative pressure method is the better imitation of the normal respiration. On the other hand, it has been proved that the results under positive and negative pressure of like value, and the choice of apparatus depends on which is best adapted for your facilities. Many apparatus are portable and best adapted for certain surgeons; other more cumbersome ones are best for hospital use. Our indebtedness to Dr. Meyer for the cabinet which he has constructed has not, I think, been sufficiently emphasized, for although he cannot expect us all to have an apparatus which combines the two methods, he has nevertheless an opportunity to determine whether or not one or the other method is applicable to a certain class of thoracic cases. Kuttner has operated alternately with both methods, but having started an operation with one he cannot change to the other, a possibility which is beautifully carried out in Dr. Meyer's apparatus. A word about empyema. It is safe to say that for the present we shall not all adopt the methods of Dr. Beck or Dr. Murphy, although their results are promising and may eventually become the methods of choice. Until that time arrives, I would emphasize the fact that most of the cases suitable for bismuth injection or thoracoplastic operation result from the neglect of the surgeon who has operated in the first stage, and I urge surgeons to see to it that the lung is brought to the chest wall in the after-treatment of empyema or in accidental pleural injuries. If this is accomplished, this discussion of the proper method of treating old empyema sinuses will no longer be a question for us to consider.

DR. N. W. GREEN, New York: Dr. Meyer's paper was especially interesting, where he showed the method of resection of the lung and of dealing with the bronchi. Of course, the closure of the bronchus is the important step in resecting the lung, and Dr. Meyer combats infection from this source, by his angiotribe method. We also have used a similar method, cutting the bronchus with the cautery after pinching it and ligating the four blood-vessels at the hilus of the lung over it. The entire lung can be taken out with ease. We must realize that there is a large field for operative work in the chest, when we consider that the pathologic conditions in the chest are so numerous, and that tuberculous processes in the lung lie dormant for many years. Dr. Willard mentioned that the cavities in the lung may be numerous or multiple. In the ordinary thoracotomy under differential pressure we can open the chest with impunity; we can explore the lung surface, and, in many cases, we can tell whether there is only one diseased spot or many, and be prepared to apply the correct treatment without causing any injury. Dr. Meltzer mentioned the use of atropin. Last year Dr. Schäfer of Edinburgh, Scotland, referred to its use in prevention of shock, and we have found it useful for that purpose in our operative work. A small dose of atropin, from 1/100 to 1/50 of a grain, may be administered a few minutes before beginning the anesthesia. Dr. Fell spoke of over-expansion of the lung. There is not so much danger of this in his work. One can raise the pressure to 60 millimeters while the chest wall is intact, without causing rupture of the lung, but it is a different matter when the lung is outside of the chest cavity. In that case we may do injury. I wish to commend to you the idea of thoracotomy under differential pressure for exploration, either for esophagus involvement or for pulmonary involvement of one form or another. I think that the procedure will probably come into more universal use even as exploratory operations are performed for abdominal disease, after all other means of diagnosis have been employed.

DR. J. B. MURPHY, Chicago: In empyema that does not communicate with a bronchus and that does not communicate by an external sinus with the body surface, what shall we do? Render that cavity sterile without opening it, and permit absorption of the sterile fluid to take place. This can be accomplished first, by simple aspiration and its change in the circulation in the wall of the abscess; second, by the injection into the abscess of some enzyme or irritant that causes polymorphonuclear leucocytosis in the cavity. Pleuritic effusions are not absorbed like many of the acute pus accumulations in other parts of the body that have ceased to destroy, because they have in them no material that converts the albuminoid into absorbable peptones. We can overcome that by injection of sterile trypsin, or better and more easily, by injecting into the pleural cavity a few drams or ounces of a 2 per cent. solution of formalin in glycerin. Eleven years ago, at Denver, I discussed the treatment of pleurisy with effusion in tuberculosis. Professor Friedrich has given us an operation which will enable us to accomplish exactly what Nature does, namely, pulmonary compression for repair of the tuberculous lesion, which we have heretofore tried to prevent by early aspiration of the fluid. He has shown that by excising a portion of the chest wall the lung is permitted to contract or to be compressed during the process of repair; a procedure which is in accordance with our knowledge of the repair of tuberculosis in any part of the body. I showed at the Denver Session that the fluid effusion compresses the lung and favors the processes of repair, and that the nitrogen or air could be used as a substitute for the fluid. When the tuberculous focus is about to penetrate the surface of the lung through the pleura, Nature produces in the pleura an effusion, and that effusion gradually compresses that lung up to one corner and holds it there while the process of repair

is going on, and finally removes this by absorption. That effusion is of advantage during the process of repair if the effusion is sterile. When it becomes an empyema, when it becomes septic, then we have in addition the destructive effects of the infection; we have increased temperature and sepsis, which is very detrimental to the patient's general condition and to the process of repair; therefore it must be rendered sterile by aspiration and repeated injections of formalin solution until pus ceases to form. To other operations for removal of lung many years ago, I added experiments to show how the bronchus could be closed, and how a portion of the lung could be excised successfully. This last can be accomplished when a whole lobe is to be removed by dislocating it to the surface and allowing it to adhere and slough off. Furthermore, drainage of a circumscribed cavity of a tuberculous lung by external drainage has to be taken into account in another element—the repair of the tuberculous process after it has been drained is always slow and frequently fails of completion. If I were to lay down a law in the management of empyema, it would be this: No case of pus in the pleural cavity, not connecting with a bronchus, should ever be opened or drained until the surgeon has figured out how he is going to close or obliterate that cavity. It is easy to open the chest wall in empyema, and often impossible to close it.

Dr. Beck has brought into this field, as it appears now, a most valuable aid in the closure of these sinuses. I regret that I have not had any experience in this method. The element of pneumothorax in connection with the surgery of the lung, *per se*, is a very minor one, and positive or negative pressure apparatus will have little value in the surgery of the lung and pleura. It will have a place in the surgery of the esophagus, and in surgery where one has to remove a tumor from the mediastinum, as shown by Professor Friedrich, where one may perhaps open the pleura on both sides. Notwithstanding the air admission on one side, if the mediastinum be immobilized so that it does not vibrate during the operation, one lung can be completely compressed and the surgeon can work with that lung compressed or drawn out of the chest cavity without any inconvenience as respiratory exchange goes on in the other lung. With the mediastinum vibrating there is no respiratory exchange.

DR. P. C. HARTFORD, East Palestine, Ohio: Knowing that an actual demonstration would be better than to read a paper, I have the pleasure of showing you a case of empyema cured by Dr. Beck's method of injecting bismuth paste. The little girl was operated on four years ago for empyema. The first operation proved a failure, a sinus remaining. The second operation, performed two years later, was also a failure. I saw the little girl for the first time last October, when she had a large sinus in her side. The first operation was a partial resection of the rib, with drainage four months after the pneumonia had occurred. The second operation was done to heal the old sinus. One injection of the bismuth paste entirely healed the cavity. The little girl has had no rise of temperature and no difficulty whatever since the first injection.

DR. A. J. OCHSNER, Chicago: I consider the use of bismuth paste in the treatment of sinuses and abscesses following operations for empyema as one of the most valuable contributions to surgery during the past five or ten years. In empyema and abscess following empyema, I have not used it as a prophylactic, as suggested by Dr. Beck, but I have used it in patients who had been operated on before this method was introduced, sinuses that had remained open for months or even years; patients who had been operated on by resection of the ribs primarily, and secondarily by Estlander's operation, and in one case I performed a Schede operation after these two operations. Of fourteen patients whom I have treated by this method, and I have two under treatment now, in twelve the sinuses have healed; and I am sure that they would have remained unhealed up to the present time were it not for this method. One feature of the method is that it does not matter whether the bronchus opens into the cavity or not. All physicians know how difficult it was formerly to treat and heal these cases, but with this method it does not matter how extensive the cavity is. I have had several cases in which I have been able to inject 600 or 700 c.c. of bismuth paste, and still the sinuses have healed. Therefore, I wish to impress on you the wisdom of using this bismuth paste in cases of empyema, no matter how bad they are. You will find that in a week or ten days or, perhaps, two weeks, the rise of temperature will disappear, and these patients that go about in a septic condition will no longer be septic. The anemia will begin to disappear, and you will be astonished to note the progress that these patients make.

A word as to the method of application. In speaking with various surgeons, I was impressed with the fact that they imagined that it was a difficult or troublesome problem to treat patients in this way. I take a large glass syringe, put the point or nozzle into the abscess, or if there is a sinus, put a rubber tube into the abscess through the sinus. I heat one part of bismuth and two parts of vaselin to 110 or 120 F., pour the mixture into the cavity until it is full and put a stopper of gauze into the outer opening. If the patient shows irritation, or bismuth poisoning, I put a rubber tube into the cavity, pour in hot olive oil, let the bismuth run out, and the symptoms of poisoning disappear, although in my own cases I have not had to do this. In 2 cases I have encountered in the practice of other surgeons, this procedure had to be carried out.

DR. CHARLES A. POWERS, Denver: I am impressed by the probable value of this operation of major thoracoplasty in pulmonary tuberculosis which has been brought to us by Professor Friedrich. It is employed by him in practically hopeless cases, and a number of his patients have shown marked improvement. I had the pleasure of witnessing one of these operations in Marburg in 1908, and was impressed by the skill, rapidity and thoroughness with which Professor Friedrich removed all the ribs from the first to the tenth, inclusive, in a young man with a progressive, unilateral cavernous pulmonary tuberculosis. The operation at first thought seems a staggering one, but I believe that there may be much of value in it. The modified pneumatic cabinet of Dr. Willy Meyer marks a definite advance in pulmonary surgery.

DR. E. G. BECK, Chicago: The point to which I wish to speak now is again to call attention to the fact that there is danger of bismuth poisoning in this method. I do not think that it is necessary to use such large quantities of the paste. In Dr. Hartford's case only 1 ounce was used and the result was a good one. Furthermore, in case there is a blue line on the gums, this does not mean that it is a case of poisoning. I regard that as a favorable sign, because at that time the patients improve most rapidly. If, however, you find ulceration of the gums or pharynx or albumin in the urine, excessive loss of weight or cyanosis, then it is time to remove the paste, but not by scraping. If the cavity be scraped greater absorption is invited and more poisoning. This mistake was made in one case of which I have knowledge, and the patient died. One way to prevent the occurrence of poisoning is to inject warm olive oil into the cavity, leave it there for twenty-four hours, when it will have formed a gray emulsion which can easily be sucked out by a syringe, and the patient will begin to improve from that moment.

PROFESSOR FRIEDRICH, Marburg, Germany: The important thing to be learned from this discussion is that we are in a position to treat empyema successfully, as shown by Murphy, Ochsner and Beck. We are getting beyond the point where empyema must be treated by resection of the ribs. Time forbids answering Dr. Powers' question *in extenso*. As to the use of positive and negative pressure, I think we must say that in most intrathoracic procedures these things are unnecessary; on the other hand, some of the successes in lung surgery depend on these measures. We have not advanced so far in lung surgery as we have in abdominal surgery. We do not hesitate to perform an exploratory laparotomy, and it is extremely probable that before long we will do likewise in the case of lung tumors, and it is here that the differential pressure method will be of great usefulness. We can expose the lung, inspect it, palpate it without doing injury, and when we can guarantee that we can employ asepsis as in exploratory laparotomy, greater progress will be insured than I have dared to indicate in my paper. I wish to say that in America I have had an unusual opportunity to see the unexpected and unusual success of animal experimentation, which must be our object if we want to see lung surgery advance. We must

resort to procedures that make lung intervention free from danger. If the pulmonary artery to one lobe of the lung is tied, there results a complete atrophy of that lobe without any evidence or manifestation of disease or pathologic change. Six weeks after the tying, which is a very easy procedure, the lobe has atrophied completely and is empty of blood. For the extirpation of a tumor, that knowledge is of the greatest importance.

DR. WILLY MEYER, New York: From what I have seen in operations on dogs and human beings, I fully agree with Professor Friedrich that "when it comes to opening the chest wall in cases in which the pleura and lungs are adherent, we can, of course, operate safely without differential pressure, but if there are no adhesions present, there can be no doubt that the safe operation is that done under differential pressure." If we want to make progress in this field, and we all want to do that, now that the thoracic cavity has been opened to surgery in a safe way, we must recognize the fundamental rule: Operate under differential pressure if there are no adhesions between pulmonal and costal pleura. The gravity of the occurrence of an acute pneumothorax is no bugbear. It makes a great difference whether we operate on a healthy dog or on a diseased human being. If we must operate on the diseased human being, and there are no adhesions present, we can do a safe exploratory thoracotomy under differential pressure; the patient will most probably stand the operation well, provided he stands the anesthesia. If we do the operation without differential pressure, there is a chance that the patient will die in direct consequence of the operation. Therefore, the discoveries of Sauerbruch and Brauer operating under negative or positive differential pressure, are fundamental principles in intrathoracic surgical work. With regard to the preliminary hypodermic use of atropin, I read recently the report of an experimenter, published in THE JOURNAL, Jan. 30, 1909, p. 328. Every fowl operated on by these colleagues had died. When atropin was first used, the animals recovered. I have seen in my work on dogs that a hypodermic of atropin reduces the seriousness of major operations. Cancer of the esophagus is the field in which the surgeon can truly help suffering humanity. So far, every patient with cancer of the esophagus must die. In making use of operating under differential pressure, every surgeon of dexterity should now help in solving this problem. We must succeed in saving some of these patients, and I am sure that we will succeed.

With reference to Dr. Willard's humorous remark that with an aëroplane and my cabinet we would soon hear of patients being lifted into the skies and operated on there, I would say that in using my new large chamber we can place the patient up in the clouds, while the surgeon remains on earth. Converting the positive pressure cabinet, which forms a part of the large negative chamber into a negative one by reversing the pump. We produced negative pressure instead of positive, in the small chamber and a still lower negative pressure in the large chamber. Thus, for instance, operated with 744 degrees mercury in the large chamber and 752 in the small one. We simply shifted the atmosphere downward. In other words, my new apparatus makes thoracic work independent with reference to having 760 degrees mercury always represent one factor of the differential pressure. Perhaps this independence may prove of importance in the future when operating on tuberculous lungs. Thus, what Dr. Willard prophesied might happen, has happened already: a surgeon in Philadelphia or New York can operate on a patient who is lifted up into the clouds of the Adirondack Mountains.

DR. H. H. JANEWAY, New York: While there can be no question that negative and positive pressure is of advantage, I want to emphasize the fact that intrathoracic operations can be done better when we use artificial respiration than when we do not. In operations on the esophagus, this is true to a still greater degree. The most complicated conditions are made easy, and successful issue is the rule. This is a definite surgical problem that presents itself, and we must not shrink from it. By systematic experiments on animals, and by carefully compiling our observations on human beings, there is no reason why we should not hope some day to find a successful solution of the problem. It certainly is not beyond our powers, but we must observe, study and learn.

THE CLINICAL ESTIMATION OF AMMONIA IN THE URINE BY THE FORMALIN METHOD *

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The great importance of the routine estimation of the urinary ammonia in cases of acidosis is now attracting much attention, and the object of this paper is to report the study of a method the technic of which is so simple as to be available to the average clinical worker with limited laboratory facilities. It is hoped that the more general adoption of the ammonia determination will thus be encouraged. Of the several forms of acidosis always tending to develop symptoms of acid intoxication, those which may occur in diabetes and pregnancy are probably the most important. The chief urinary symptoms are: (1) the presence of the so-called acetone bodies, i. e., acetone, diacetic acid, and, in severe cases, beta-oxybutyric acid; (2) a marked increase in the relative and absolute output of ammonia. The quantitative determination of the acetone bodies, while highly desirable from the standpoints of both prognosis and treatment, is long and difficult. The ammonia, on the other hand, can be readily determined and affords an index not only as to the quantity of acetone bodies excreted, but to the total amount produced; in other words, it points out the degree of acidosis. The clinical determination of ammonia, therefore, is the only procedure readily practicable at present for indicating the danger-line of acid intoxication in diabetes and is of vastly greater significance than the sugar estimation. Emerson[1] says in this connection:

> Patients with much acidosis die of coma unless from some intercurrent disease, and there is no case of true coma yet studied without a previous acidosis. The amount of these (acid) bodies is perhaps better estimated by the ammonia output than by their direct determination, since the symptoms are caused by a withdrawal of the body alkali which the ammonia protects. An increase of ammonia means the presence of at least 10 gm. of oxybutyric acid per day, a marked increase of about 15 gm., 4 gm. of ammonia indicating 16 gm. of the acid. Naunyn considers that over 3 gm. of ammonia per day means danger of coma, and that if 4 gm. per day are excreted coma is sure to result unless alkaline treatment is begun at once.

On an ordinary mixed diet the absolute daily ammonia output is normally about 0.7 gm. This may increase to 8 gm. or even 12 gm. daily in diabetic patients. Simon[2] points out that high absolute values are quite constantly observed in diabetes, in which a daily elimination of from 4 to 5 gm. may be regarded as common. It is generally conceded that the relative increase of ammonia is more significant than variations in the absolute quantity. This is represented by the so-called ammonia quotient, i. e., the ammonia-nitrogen divided by the total nitrogen, and should always be determined whenever possible; it is normally from 3.5 to 5 per cent. In diabetic cases the ammonia quotient may rise to 40 or even 60 per cent. Goodall and Joslin[3] have recently made an extensive and valuable study of the ammonia output in diabetes, emphasizing its great importance. They conclude that quantities of ammonia reaching 5 gm. in twenty-four hours indicate a very severe form of diabetes, which usually proves fatal within a year, and

* From the Chemical Laboratory of the U. S. Naval Medical School, Washington, D. C.

1. Emerson, C. P.: Clinical Diagnosis, 1908, p. 203.
2. Simon, C. E.: A Manual of Clinical Diagnosis, 1907, p. 416
3. Goodall, H. W., and Joslin, E. P.: Bost. Med. and Surg. Jour., 1908, clviii, 655.

that patients under 40 years of age tolerate an acidosis expressed in terms of 4 to 5 gm. ammonia far better than those above 50 years tolerate an acidosis of 2.5 to 4 gm. ammonia. Williams[4] states that the ammonia quotient may increase to 20 or even 40 per cent. in the pernicious vomiting of pregnancy and is an indication for emptying the uterus. In the case of nervous vomiting, reflex from the pelvis, and in eclampsia it is unchanged. The estimation of total nitrogen is not feasible clinically with existing methods, but, knowing the character of the diet, the absolute ammonia output alone is of very great value. The need for a simple method of estimation is obvious. The vacuum distillation methods of recent years represent great advances and are highly accurate, but they require time and facilities not possessed by the average clinical worker.

PRINCIPLE OF THE FORMALIN METHOD

An aqueous solution of an ammonium salt is treated with an excess of formalin and a few drops of phenolphthalein added as the indicator. It is now titrated with one-tenth normal sodium hydroxid, liberating ammonia, which reacts quantitatively with formalin to form hexamethylentetramine, which is neutral to phenolphthalein. The acid radical of the salt set free is titrated with the alkali, thus giving an index to the amount of ammonia present. This reaction has long been known in the literature.

PREVIOUS EXPERIMENTS

Ronchèse[5] first applied this principle to the estimation of ammonia in urine. Ten c.c. of urine were diluted to 50 c.c. with distilled water and titrated to the neutral point, using phenolphthalein as the indicator. Fifteen c.c. of 20 per cent. commercial formalin, made exactly neutral previously with sodium hydroxid, were then added, and the mixture then titrated with one-tenth normal sodium hydroxid. The second reading on the burette was reported as the number of cubic centimeters of decinormal ammonia in the sample. The method was checked by adding known quantities of ammonia to various urinary samples and it was claimed that quantitative recovery was the rule.

Repiton[6] has published a similar procedure in which acetaldehyde was substituted for the formalin; substantially the same claims were made for this process.

Malfatti[7] has recently reported a method essentially the same as the process of Ronchèse, but the degree of accuracy was tested with greater thoroughness. Controls were made with the methods both of Schlosing and Folin;[8] the formalin procedure showing a tendency to higher results. The influence of uric acid, urea, and creatinin on the titration was studied with negative results. No reference, however, was made to Ronchèse's work, and the latter[9] has called attention to this matter in a later article, emphasizing that Malfatti is not entitled to credit for the method.

Mathison[10] has recently modified this method by saturation of the urine with a neutral potassium oxalate before carrying out the titration, with a view to sharpening the end-point. Folin[11] first employed this salt to rule out the disturbing effects of ammonia salts and calcium phosphate in determining the end-point in the titration of urinary acidity, with phenolphthalein as the indicator. Mathison emphasizes the value of this modification. The results were checked by Shaffer's[12] method of vacuum distillation and found to be about 15 per cent. higher by the formalin process. He is unable to explain the discrepancy. Urea, uric acid, and creatinin were added to urine without affecting the ammonia values, thus in agreement with Malfatti's claim that these bodies are not sources of error.

PRESENT EXPERIMENTS

Several months ago I made a large number of titrations with various urinary samples, following the directions of Ronchèse and Malfatti. It was impossible to determine the end-point of the titration with any degree of sharpness, and the method was abandoned in this form. Cochineal and alizarin red were substituted as indicators for phenolphthalein, as they give sharp end-points in the presence of ammonia salts in aqueous distillates. They were abandoned as not sufficiently sensitive, even when the method was applied to chemically pure aqueous solutions of ammonia salts. The use of neutral potassium oxalate, as recommended by Folin, occurred to me in this connection before Mathison's paper appeared. The urine was saturated with the salt; the procedure otherwise was carried out exactly as described by the above authors. The end-point was now brought with a fair degree of sharpness; this improvement was particularly of advantage in deeply colored urines.

The method was applied to aqueous solutions of one-twentieth normal, one-tenth normal, and one-half normal ammonium chlorid with a resultant accuracy between 90 and 95 per cent. Known quanties of this salt were added to urine and recovered within the limits just stated. A series of estimations were carried out and controlled by Shaffer's vacuum distillation method. The data are assembled in the second and fourth columns of the accompanying table. The results of Shaffer's method average 20.33 per cent. higher, while Mathison obtained a corresponding figure of 15 per cent.

THE DETERMINATIONS OF AMMONIA

	1	2	3	4
	Sample of urine.	Formalin method uncleared.	Formalin method cleared with lead.	Shaffer's method.
		%	%	%
1		0.0586	0.0537	0.0507
2		0.0816	0.0705	0.0673
3		0.0782	0.0721	0.0697
4		0.0748	0.0736	0.0694
5		0.0591	0.0544	0.0501
6		0.0450	0.0382	0.0361
7		0.0599	0.0527	0.0499
8		0.0221	0.0162	0.0159
9		0.0629	0.0535	0.0507
10		0.0127	0.0102	0.0104
11		0.0559	0.0527	0.0504
12		0.0501	0.0425	0.0388
13		0.0476	0.0399	0.0354
14		0.0411	0.0348	0.0331
15		0.0642	0.0578	0.0544
16		0.0493	0.0461	0.0459
17		0.0331	0.0297	0.0253
18		0.0546	0.0535	0.0527
19		0.0433	0.0382	0.0367
20		0.0577	0.0534	0.0493
21		0.1470	0.1402	0.1309
22		0.0690	0.0620	0.0595
23		0.0476	0.0428	0.0408
24		0.0535	0.0476	0.0449

The sharpness of the end-point still left much to be desired, and it occurred to me that clearing the urine with subacetate of lead might be of advantage in removing interfering coloring matter before the titration. The excess of lead was removed by neutral potassium oxalate.

4. Emerson, C. P.: Clinical Diagnosis, 1908, p. 124.
5. Ronchèse, A.: Bull. Soc. chim. de France, 1907, Series, i, 999.
6. Repiton, F.: Compt. rend. Soc. d. biol., 1907, pp. 62, 1065, 1066.
7. Malfatti, H.: Ztschr. f. anal. Chem., 1908, No. 5, p. 723.
8. Folin, O.: Am. Jour. Physiol., 1908, ix, 265.
9. Ronchèse, A.: Bull. Soc. chim. de France, 1908, Series 4, iii, 840.
10. Mathison, G. C.: Brit. Med. Jour., March 20, 1909, p. 715; Am. Jour. Urol., May, 1909.
11. Folin, O.: Ztschr. f. Physiol. Chem., 1902, xxxvii, 1.
12. Shaffer, P.: Am. Jour. Physiol., 1902, viii, 330.

The results were striking. The end-point of the titration was brought out with nearly the sharpness obtained in titrating a watery distillate with cochineal or alizarin red. Many samples after dilution were practically colorless, and in no case was there more than a slight tinge of pigment. Known amounts of ammonia added to the urine were recovered with the same degree of accuracy as without the modification.

The technic of the modified method is as follows:

About 60 c.c. of filtered urine are treated with 3 gm. of basic lead acetate, well stirred, allowed to stand a few minutes and filtered. The filtrate is treated with 2 gm. of neutral potassium oxalate, again well stirred and filtered. Ten c.c. of the clear filtrate are diluted to about 50 c.c. with distilled water and a few drops of 1 per cent. phenolphthalein added. The fluid will be slightly aklaline or acid; more frequently the latter. Fifteen gm. of neutral potassium oxalate are added, thoroughly stirred, and the specimen exactly neutralized with one-tenth normal sodium hydroxid or sulphuric acid; 20 c.c. of 20 per cent. commercial formalin, previously made neutral, are added and the solution again titrated with one-tenth decinormal sodium hydroxid. Every cubic centimeter of one-tenth normal sodium hydroxid corresponds to 0.0017 gm. ammonia. The burette reading of the second titration multiplied by this factor represents the amount of ammonia in 10 c.c. of urine. The quantity is then calculated on the basis of the twenty-four-hour volume.

The technic of this method should recommend itself to practitioners for its simplicity; an estimation can readily be made in duplicate in ten minutes. The accompanying table in Column 2 shows the data by the modified method, which averaged only 6 per cent. higher than the results by the Shaffer method. It is obvious that this difference would be of no clinical importance, for only large quantitative changes in the output of ammonia have significance clinically. Clearing with lead not only improves the end-point, but improves the accuracy of the method by nearly 15 per cent.

Sörensen[13] recently published a paper with an important bearing on the accuracy of the formalin method. He has demonstrated that formalin combines with amido-acids, liberating acid radicals which may be titrated, thus giving a measure as to the amount of amido-acids present. A number of acids, i. e., alanin, leucin, tyrosin, etc., were titrated, and, with the exception of tyrosin, were capable of quantitative determination. Obviously such bodies in the urine would be included in the ammonia determination and thus be a source of error. This, however, could not account for the difference between Columns 3 and 4 of the table, as amido-acids are not removed from the urine by basic lead acetate. Sörensen reports that uric acid reacts with formalin and this body is thrown out by the clearing reagent. Uric acid was estimated in a number of the samples referred to, but the quantity present accounted for only a part of the differences observed between Columns 1 and 2. Hippuric acid, which is not thrown down by clearing, was tested, but does not affect the formalin titration even when added in large amounts.

The important consideration clinically is the extent of the occurrence of amido-acids in the urine. Brugsch and Schittenhelm,[14] in reviewing the subject recently, state that glycocoll is the only amido-acid thus far demonstrated in normal urine and occurs in very slight amounts. Leucin and tyrosin have been shown in the cases of acute yellow atrophy, phosphorus-poisoning and in diabetic coma. Mathison says that it is just in those pathologic conditions when the output of ammonia is high that large quantities of amido-acids are excreted. These bodies replace a portion of urea, so their significance clinically is in the same direction as ammonia. If the formalin method gives the sum of ammonia and amido-acids, the ammonia could be estimated by Shaffer's vacuum distillation method and the amido-acids indirectly determined by difference.

13. Sörensen: Biochem. Ztschr., 1908, vii, 47.
14. Brugsch, J., and Schittenhelm, A.: Lehrbuch klinischer Untersuchungsmethoden, 1908, pp. 463, 464 and 465.

A PLEA FOR THE MORE CAREFUL DIAGNOSIS AND TREATMENT OF FRACTURES OF THE EXTREMITIES *

E. DENEGRE MARTIN, M.D.
NEW ORLEANS

As in all other surgical conditions, great advancement has been made in the treatment of fractures. The suspension method of the lower extremities perfected by Hodgen and the ambulatory treatment suggested by Krause, Dollinger and others, have done much not only for the comfort of patients, but unquestionably have saved many an old sufferer from death by pneumonia. The introduction of anesthesia and the certainty of asepsis have reduced the mortality in compound fractures to practically *nil*. The advent of the *x*-ray has made a doubtful diagnosis a certainty and excellent results have been secured by this means in many apparently hopeless cases. It may, therefore, appear strange in the present-day advancement of surgical progress, when technic has reached almost a point of perfection, that one should be pleading for more thoroughness in so important a condition as the treatment of fractures. It is not that this branch of surgery has received less attention, for, thanks to Stimson, Scudder, Allis, Pilcher, Cabot, Hodgen, Whitman, Smith, Kocher, Korsch, Dollinger, Downey, and hundreds of others who have contributed so much to the literature, our technic is nearly perfect, but I have been forcibly impressed by the fact that we are treating to-day more deformed and ununited fractures as secondary conditions than any others in surgery. It strikes me that these bad results are due to one of several conditions; primarily, to our methods of treatment, and, secondarily, to the fact that this particular branch of surgery has not been assigned to its proper domain.

In regard to the first point, is it not a fact that students are taught to treat fractures from the benches? The subject is hurriedly gone over, probably a dozen or more fractures are demonstrated in one lecture, a number of intricate splints are exhibited, and reference is made to plaster of Paris as one of the materials to be used in the manufacture of splints. What is the result? Unless the student is fortunate in securing an internship in some hospital, he goes out to treat fractures with a vague idea that it means a broken bone, and if he can only put it in position and hold it with some form of apparatus it will unite and that will be the end of it. If he should attempt to use plaster, of which he knows absolutely nothing, he has no means of telling whether it be good or bad, and the chances are that it will not set. The result is a deformed or ununited fracture.

In regard to the second point, there is no question that in this special line of work mechanical skill is required. How many physicians possess this? The orthopedist is the outcome of a demand for the correction of

* Read in the Section on Surgery of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.

deformities, most of which result from badly treated fractures. The orthopedist is, or should be, a mechanical surgeon; why not, therefore, in this era of specialists let him utilize his skill, not wholly for the correction of deformities, but for their prevention.

No inexperienced physician would attempt to do a laparotomy for some abdominal condition with which he was not familiar, and yet how many would think of referring a simple fracture to a surgeon? In the former case, life might be involved; in the latter, the worst that could happen would be an imperfect result, a crippled limb which the poor patient is convinced was the outcome of his misfortune and not the result of the faulty technic applied.

It is time for every practitioner to realize that, unless he has had some surgical experience and is equipped with an *x*-ray outfit, it is as much his duty, when possible, to refer these patients to properly qualified surgeons as other cases which he does not feel will fare well in his hands.

It is not my purpose to discuss the treatment of fractures, but I am glad to see so many medical men advocating the operative treatment. I see no reason why we should hesitate to expose a fracture at any time we fail to get good apposition. It is time that we should realize that the bony framework of the human body is its most important structure, and if this is injured at any point, or is so much out of place that muscular action is interfered with, we have a hopeless cripple on our hands; and I regret to say that in many instances the crippled condition is due not so much to the cause as to the treatment.

We hear many criticisms of the use of wire and staples in the treatment of ununited fractures, and numerous are the suggestions made to do away with the use of all foreign bodies. I believe that whenever it is possible to reduce a fracture and to hold it in position with a properly fitting splint it should be done, but I also believe that when there is danger of the fragments slipping the best results will be obtained by the use of wire or staples, even if these have to be removed later. My experience is that a staple is less liable to give trouble than wire and is much more efficient. For years I have used staples of different sizes made of piano wire, which can be driven into any bone, and these have never given trouble, unless infection followed, and they are always easy to remove when necessary.

In conclusion, I would suggest that we lay more stress on the importance of this branch of surgery, which furnishes material for more malpractice suits than any other, and is costing railroads and manufactories thousands of dollars annually.

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ABSTRACT OF DISCUSSION

DR. C. L. SCUDDER, Boston: The operative treatment of recent closed fractures is a very vital subject, surprisingly suggestive, full of interest to every one. We all believe in the operative treatment of certain fractures, provided the indications are unmistakable. Operating on freshly fractured bone is to-day safe if the operative technic is perfect. Osteitis and necrosis do not commonly follow properly placed direct fixative materials—wire, nails, pegs, plates or screws. Union of the fracture is usually facilitated and not delayed by operation. Damage to the soft parts extensive enough to cause postoperative difficulties may be avoided and is not a menace. The local conditions surrounding recent fracture are quite different from those discovered at the seat of an old fracture.

In our enthusiasm for operative victories we must stop and ask ourselves, are we securing from the non-operative treatment all that we possibly can? When should we employ operative measures? What should be the general indications for operation?

Deficiencies in non-operative treatment, which unquestionably do exist, should be remedied, not by operating more frequently but by exercising greater care in the employment of the fundamental principles recognized the world over as underlying the treatment of all fractures, namely, general anesthesia, traction, counter-traction; pressure, counter-pressure; the exact application of anatomic knowledge; immobilization; the comparative use of the Roentgen ray; massage; the care of joints adjacent to the injury, and, ultimately, the securing approximately anatomic form and perfect function. Whenever and wherever these basic principles are applied intelligently and consistently, the results are uniformly good and the operative margin is then narrow. Bardenheuer, in Germany, has demonstrated the efficiency of non-operative methods. Even though Bardenheuer's details may be too cumbersome for general use, he has proved that results following the consistent employment of non-operative methods are satisfactory. That non-operative measures are efficient in the treatment of the vast majority of fractures has been proved in this country over and over again in hospital and private practice. Many facts in corroboration of this statement have been recently collected by DaCosta and others, and are still being assembled, and are worthy of consideration. I want to dissuade any one from believing that an anatomically perfect result following a fractured bone is absolutely necessary to a functionally useful limb, or is necessary to the individual. Approximate reduction, that is, non-anatomic, is followed by union and by a functionally useful part, and by no apparent deformity to the patient or his non-professional friends.

Stimson recently said regarding this matter: "Irregularities of outline are functionally and cosmetically unimportant in the great majority of cases in which proper non-operative treatment has been used." Anatomic results are ideal and theoretically desirable. Practically, they are unessential. The ideal treatment may not be the most expedient. Operation is often contraindicated chiefly because it is unnecessary. It must be remembered that the results of operative treatment may not be more satisfactory than are the results from non-operative treatment. Operation does not carry with it or imply the guarantee of a perfect anatomic result. The majority of simple or closed fractures can be satisfactorily treated by non-operative methods. The broad indication for operation, in my opinion, on recent closed fractures, in the absence of great damage to soft parts, including vessels and nerves, is the inability to bring fragments into apposition and into good alignment. Let all surgeons bestow as much thought and personal consideration on the non-operative methods in the treatment of fractured bone as the importance of the subject demands, and our non-operative results, good as they are, will improve, and the number of operable cases will increase slowly and only for good and sufficient reasons.

DR. W. LEMOYNE WILLS, Los Angeles, Cal.: It was my good fortune four years ago to see Lambotte demonstrate his method for fixation of fractures on a cadaver at the Brussels congress, and to see his convalescent patients at Stuyvensburg Hospital at Antwerp next day. For two years past I have used this method and appliance. I have had seven cases of fracture of femur and two of humerus. Of these cases I have had five simple fractures in mid-thigh and near the knee-joint, varying from thirty hours to two weeks in time from injury to operation, two ununited fractures each six weeks old with large amounts of callus and faulty angulation of fragments. Two fractures of humerus were six weeks and three months old, respectively; the latter was an old comminuted, infected gunshot fracture of the humerus with complete musculospiral paralysis. On this case I put a half-sized apparatus and relieved the pressure on the nerve which was between ends at point of fracture; the patient is making a fine recovery. Absolute fixation is desired most of all. With the Lambotte apparatus the leg can be lifted by the heel, and when union has taken place all foreign material is removed. Patients differ greatly in rapidity of callus formation, usually sufficient has been thrown out to permit safe removal of the apparatus in from four to seven weeks. The sooner the drills are out

the better. The drill holes soon close and give no trouble. We all know what unsatisfactory results are obtained by the commonly used closed treatment, and by the suturing and wiring of the fragments, when there may be shortening from one-half to one and a half or two inches. I have shortening, in only one case—one-fourth of an inch—and that because the man disobeyed orders and put weight too soon on a soft callus. After absolute fixation the chief advantages are: the ability to inspect the wound every day; less injury to the periosteum than by any other operative method; and more rapid and normal callus formation and union. The first dressing (removed in twenty-four hours) will be found saturated with serum and blood. I use two or three drains, which are removed in two or three days, leaving the wound perfectly dry. It is better to have the serum and blood out than inside congesting the damaged tissues. This is really an ambulatory method, enabling the patient to be put in a wheeled chair, after ten days, and kept in the open air. Of course, absolute asepsis must be preserved. I have had infection in two cases, but that was due to severe bruising and crushing of muscles at time of injury, and the delay in operation, two weeks having elapsed.

DR. A. J. OCHSNER, Chicago: My ideas on treatment of fractures are pronounced. In certain fractures, like that of the patella, the anatomic conditions are such that the results, even with the best non-operative treatment, must be bad. There are other conditions in which these conditions must be bad, but with the exception of these conditions, if we employ certain definite principles the results must be good. Of course, if we do not teach our assistants that a fracture held by plaster-of Paris in a deformed position is sure to heal in that position, we must expect to get bad results. If we do not teach our assistants the proper use of splints and the proper methods of reduction of fractures we must not look for good results. But if a surgeon with good judgment and with experience in these principles will employ them, the number of cases in which the operative treatment should be employed must be very small.

DR. LEONARD FREEMAN, Denver: There are two kinds of fractures which seem to demand operation, providing the surroundings are perfect, and the operator is competent. In one kind we are unable to reduce the fragments at all; in the other, although we are able to place the bones in apposition, they have little or no tendency to stay there. I desire to exhibit a clamp which I have devised for holding fractures of the latter class which cannot be controlled by ordinary means. It is not so much the clamp to which I wish to call attention, but rather the method of its application. The clamp is simple; it consists of two steel strips fastened together by screws which can be tightened with a key. (Figs. 1 and 2 and Fig. 3a.) The essential feature is that these strips of steel are lined with soft wood. From two to four long screws, as required, are inserted in the end of the fragments and allowed to project beyond the skin. The screws are then clamped together by means of the wood-lined steel strips, the wood holding them firmly and preventing slipping. There is no

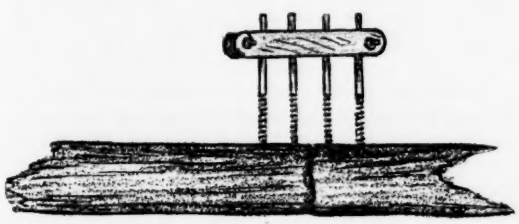

Fig. 1.

question as to the effectiveness of the clamp when it is once in place. The problem is to use it in recent fractures without making a large wound and without extensive injury to the tissues—in other words, without exposing the patient to the danger of a severe operation. This could readily be done if it were possible to insert the screws into the bone through small incisions in the skin, adjust the fragments, and then clamp the screws; but any one who attempts to do this without proper apparatus will find that the drill is apt to slip, and that when an effort is made to find the hole with the end of the screw after removing the drill it cannot be done owing to the intervention of the soft parts. Drills cannot be left in place as substitutes for screws, because they do not fit tightly enough. I have overcome this difficulty by using a small steel tube which is provided at one end with sharp teeth. Into this tube is placed an obturator (Fig. 3c) with a blunt point which obscures the teeth and enables one to slip a screw (Fig. 3e) through a small incision in the skin and through the soft parts to the bone. The obturator is then removed and the tube tapped down so that the teeth engage in the periosteum, thus preventing slipping. A drill (Fig. 3d) is then introduced through the tube after taking out the obturator. The drill has an adjustable shoulder so that it will remain central

Fig. 2.

within the tube. A hole is then bored into the bone, the drill is removed, and a screw can easily be introduced, the tube being pulled out over the screw. In this way as many screws as necessary can be employed and left to protrude through small openings in the skin which produce but insignificant scars. This apparatus can be used to great advantage in certain fractures. I have employed it in fracture of the jaw near the angle, where it is difficult to keep the jaw from dropping backward in spite of various uncomfortable splints which have

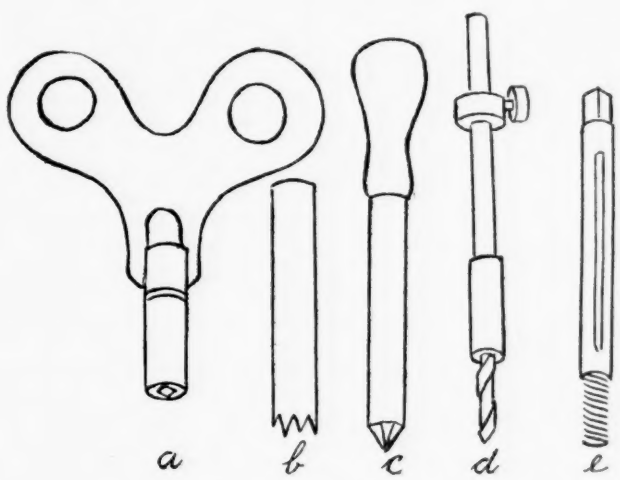

Fig. 3.

been devised. By using two screws, one in each fragment, and clamping them together on the outside, the jaw is easily and perfectly held in place. Fractures of the clavicle can also be handled in this manner, as can also oblique breaks of the tibia and fractures of the humerus and patella. I do not believe that anything is added to the danger of infection, especially if the screws are placed far enough from the break and if proper asepsis is employed, as they soon become effectually walled off from the surrounding tissues.

DR. JOHN B. WALKER, New York City: I believe that our knowledge of the treatment of fractures in America has not advanced so rapidly as it has in the treatment of abdominal and other conditions. A few years ago a leading London surgeon attempted to ascertain what was the ultimate or end-result in these fracture cases, and he sent out many letters to which he received 400 replies. He found that what was called satisfactory in London was not so regarded in the outlying districts. In the large cities the duration of the treatment of a fracture of the femur was from four to six months, whereas in the outlying districts it was from six to nine months. Since the introduction of the Roentgen ray this matter of the proper

treatment of a fracture has become a personal and important one to many surgeons. Last year the largest liability accident insurance company in this country showed that out of 100 suits for damages, 75 per cent. were brought on account of surgical conditions, and the remaining 25 per cent. on account of medical conditions. Of the damage suits brought against surgeons, 75 per cent. were on account of deformity following the treatment of a fracture. Only a year ago Mr. Lynn Thomas, a British surgeon, was sued in a case of fracture of the surgical neck of the humerus. The case passed from one court to another and at the end of a year the damages allowed were over $20,000. As Dr. Ochsner said, the statistics in our large hospitals show that, as a rule, fractures are treated by young men who do not receive any instruction from the surgeons but from previous house officers. In the large New York hospitals, when a fracture of the neck of the femur comes in, for instance, the patient has to stay for twenty-four or forty-eight hours, when he is sent to other hospitals because the hospital wants to get rid of these cases. The result is that these patients come in with much shortening and go out with considerably more shortening.

DR. J. B. MURPHY, Chicago: That the results from the treatment of fractures in the large hospitals are not satisfactory is an admitted fact. This is due to two elements; first, the neglect of these cases by the attending surgeon; and second, the imperfect understanding of the conditions of the individual fracture by the medical profession. Bad results in their order of frequency are, in Colles', in Potts', in every fracture of the neck of the femur, in fractures of the patella and in those of the olecranon. Take, for instance, Colles' fracture. The bad results seen here are not due to the fact that the bones cannot be kept in position, but to the fact that the bones are not properly replaced in over 95 per cent. of the cases. The reduction of a Colles' fracture involves a special technic, one different from that of the reduction of any of the other common fractures of the body. The fracture occurs in a certain line extending from in front upward and backward. The lower fragment is displaced upward on the posterior surface of the radius. The method of reduction is simple, easy, and uniformly neglected. First, place the thumb of the right hand on the distal fragment and put the thumb of the left hand on the proximal fragment, increasing the deformity by pressing both thumbs forward to unlock the fragments. As soon as they are unlocked, place the end of the left thumb on the nail of the right thumb and press the lower fragment forcibly downward, then reverse the pressure by flexing the patient's hand forcibly forward, and the fragments will fall into position easily and will remain there. Afterward, all that is needed is to put on the simplest kind of plaster of Paris support over the wrist. If the deformity does not remain reduced, it is because it has not been reduced properly. If the pain is severe for from twelve to twenty-four hours it indicates that the reduction is not complete.

The types that must come to operation to get good results are, first, fractures of the neck of the femur, not in old people past sixty, but in younger people who do have fractures of the neck of the femur by direct or indirect violence. It is only by inspection and careful analysis of cases and by fixing these fragments that one can reduce the deformity and keep the fragments in apposition. In fractures of the neck of the femur close to the head a very important principle is involved; that is, the presence in the proximal fragment of any osteogenetic cells for the reproduction of the bone from the head side.

The principle of the apparatus exhibited by Dr. Wills and the one by Dr. Freeman, by which one can do the work without coming in contact with the traumatized area, thus avoiding exposure to infection, is an important one and should be utilized on all occasions when the fragments can be apposed satisfactorily. One should not operate immediately after the fracture, because the tissues are then in a condition of least resistance. Operation should be postponed until an effort at regeneration of the traumatized tissues has taken place. One can do an enormous amount of work on the fifth, tenth or fifteenth day without danger of infection that could not be done on the first or second day after the accident. The lymph spaces have become cofferdammed and the new capillaries are developed to the greatest resistance against microbic invasion.

DR. CHARLES A. POWERS, Denver: I believe that open operation in simple fracture will be performed more often than it has in the past, but also that open operation in simple fractures will be the exception rather than the rule. As I look back over my own results in simple fractures treated without operation I feel that they have generally been satisfactory. I do not think the results in these fractures, when carefully treated by established methods, are notoriously bad. I am entirely in accord with Dr. Scudder. He expressed my position clearly and thoughtfully. Further, Dr. Ochsner is right when he says that on our routine hospital work we are too prone to leave the treatment of these important cases to interns of but little experience. If we pay proper attention to suitable nonoperative management we will have fewer cases which demand operation.

DR. W. L. ESTES, South Bethlehem, Pa.: While I believe that in this matter we should be rather conservative, there are some fractures that, one might say, must almost invariably be treated by the open method. I have come to the conclusion as the result of considerable experience that there are certain localities where certain fractures require an open operation. The first of these is fracture in almost any part of the shaft of the tibia, when the fracture is very oblique, with no shoulder to hold it, making it impossible to keep the fragments in position by any ordinary mechanical means. My observation of the result of other surgeons' work and my own experience has taught me that no splint or mechanical contrivance will accurately reduce and retain these fractures in proper apposition without the open method. In this day of the *x*-ray not only must the usefulness of the limb be thought of, but also the cosmetic effect. The public demands that we treat these fractures of the extremity in a way to retain the appearance as well as the usefulness of the limb. To do this it is necessary that we perform an operation when the condition and surroundings of the patient are favorable. In regard to methods of fixing the fragments in an open operation, it does not matter so much what apparatus we use so long as we do the work under proper asepsis. Either a clamp, or a screw, or a splint, applied directly to the bone, will answer the purpose. I am opposed to any method, however, which will not enable one to see whether the fragments are in apposition. One may think that he has the bones in apposition, and put on a splint, but when the *x*-ray is used he finds, much to his surprise, that there is malposition. Hence the importance of an incision down to the seat of fracture, complete exposure and accurate coaptation of the fragments under the eye and then firm fixation.

Another fracture which should be treated by the open method is fracture of the junction of the upper and middle thirds of the humerus, where the musculospiral nerve is so apt to be injured. The danger of the injury is in proportion to the violence that has been done by the ends of the fractured bone. The nerve may not give any evidence of injury immediately, but within two weeks there may be paralysis. The explanation of this late development is that one end of the displaced fragments may press against the nerve, and the developing callus does the rest. Another fracture which requires the open method is that of the inferior maxilla. These fractures are nearly always compound, and they require drainage as well as accurate replacement and fixation, hence the open method should be employed.

DR. RUDOLPH MATAS, New Orleans: It does not follow that all fractures are better treated by operative methods or that good results cannot be obtained by bloodless manipulations. Surely practitioners of surgery cannot accept the *x*-ray standards of bone setting as the sole and absolute criteria of successful treatment. We who teach surgery, while fully recognizing the great advances brought about in the treatment of fractures by open methods of reduction and fixation, must remain in sympathy with the view which holds that when a broken bone is set without any visible deformity and is followed by no abnormal disability, such a result must be regarded as a good result—even though the *x*-ray may show some displacement or imperfect apposition of

the fragments. Judging by this simple standard, there is no question that a vast number, the majority, of fractures of the extremities can be successfully treated without operation. It is only right that the art of bone-setting by bloodless manipulation should be cultivated and encouraged more than ever as an essential part of the surgeon's training. On the other hand, when it is evident that reduction is impossible and that deformity with impaired function is unavoidable in any given case of fracture, there should be no hesitation in resorting at once to the open treatment, provided all other conditions, including the operator's training, are favorable to the procedure. In conclusion, I would ask: What are we to do in operative cases in which a perfect result is obtained, a real cabinet-maker's approximation, and yet in which callus totally fails and there is no ossification? This failure of repair which I have observed in operative cases, and especially after wiring, creates a serious problem that is not solved by further operation, additional traumatism, nor by Bier's blood injections at the seat of fracture. In these cases, what will accomplish the desired result? Will orthopedic "walking" braces which do not constrict the limb, and which permit the systematic application of massage combined with hot air hyperemia? It is the walking splint, however, that is the most effective, and, in view of the not infrequent failure of union after operation, I am glad to commend the ambulant orthopedic splint as a reliable treatment for this deplorable condition.

DR. DEFOREST WILLARD, Philadelphia: Surgeons differ widely in their advocacy of operative or non-operative treatment in fractures. Dr. Martin called attention to the question of diagnosis. There is at present no reason for failing to know whether we have succeeded in the replacement of fracture. The Roentgen ray will tell us all this. It is not only necessary to reduce the fracture, but to keep it reduced. There are certainly a large number of simple fractures that do not require operative treatment, but there are cases in which it is necessary to resort to operation, *i. e.*, those in which reduction and retention are impossible and especially delayed union, nonunion, compound fractures and comminuted fractures. Fracture patients often come to the hospital and they are not seen by the surgeon at all. They are treated by the house officers; they are sometimes treated carelessly, and a bad result is sure to follow. We all have reason to know the annoyance that comes from a malpractice suit, and the Roentgen ray is adding to our troubles because while many cases are functionally perfect, they are not anatomically perfect and a jury is readily influenced. The Roentgenogram is only a shadow and not the thing itself. Look at your own shadow as you are walking on the pavement. It is not at all like yourself. In comminuted and ununited fractures I have tried wires, staples, screws, plates, clamps and everything else. We all know how often we are obliged afterward to cut down and remove these substances; therefore, whenever it is possible, I use chromicized catgut rather than any other foreign body. Magnuson has shown that metal-headed ivory screws that can be cut off on a level with the periosteum can be inserted into the bone and soon become a part of it. I believe that the use of such ivory screws will revolutionize the treatment of ununited fractures.

DR. CHARLES E. THOMPSON, Scranton, Pa.: Dr. Martin said that the fracture might slip, and stopped there. We must not be discouraged because our fractures slip. We must reduce them again, until we retain them in proper position. Dr. Ochsner spoke about the bad results obtained in the treatment of fractures in the general hospitals, but nothing has been said about the bad results obtained out in the hills by the general practitioners, nor has anything been said about the cause of these bad results. I hope college professors will tell us why these general practitioners cannot be taught to reduce fractures. Of all the delusions and snares, perpetrated on an unsuspecting profession, Buck's extension apparatus is the worst. Dr. Scudder told us something about the reduction of fractures but did not go far enough. If a fracture, say of the femur, becomes displaced after reduction, in my experience the most common cause of displacement is a muscular spasm occurring during sleep. If the fragments cannot be retained in a direct line I have frequently succeeded in retaining them at an angle, letting that deformity prevail until some union has taken place, when the bone can be very easily set in a straight line. The difficulty of having plaster set and stay set can be obviated by using crinolin sized in starch. If the bone cannot be held in proper position, a slight amount of lateral pressure, such as placing a wedge of cotton or gauze on the inside of the plaster on the third or fourth day after reduction, will hold the bones in perfect apposition. If this method fails, I have in a few cases succeeded by putting on a counter-extension transversely, and holding up the bone in the same direction, where there was a great tendency to displacement in an upward or downward direction. In another case, a compound fracture of the tibia having failed to be retained in position by ordinary methods, I inserted an osteotome, and securing a slight leverage between the ends of the bones, held then in place and had an assistant hold the osteotome in position; I then incorporated osteotome and assistant's hands in the cast. The assistant's hand was removed after the cast was hard, after the patient was put to bed; the osteotome was removed the next day. The result was ideal.

DR. ROBERT F. WEIR, New York City: We have been told, and correctly so, that fractures are hard things to treat. They tell us also that in the hospitals they are badly treated because the juvenile intern does the treating. That is true, but there is another reason which has not been mentioned why there are so many cases of malpractice. Malpractice suits are brought against the physicians who are only occasionally surgeons. If surgeons say that it is hard to treat a fracture, how can the ordinary practitioner expect to succeed in doing so? He does not attempt to do an abdominal operation, but he does not stop at treating a fracture, which we all know is a very hard thing to manage successfully. The majority of cases should be judged not by hospital treatment, not by the treatment given them by the general practitioner, who, with the aid of the misinterpreted *x*-ray picture, is so frequently sued, but by the outcome of the cases treated by a competent surgeon, cases that the latter treats in his private practice. As I look back on my cases of fracture, I must say that the majority of them have terminated in a very satisfactory manner. I do not mean to say that some of the patients have not had deformities, but the individuals have been able to go about and to use the extremity. The result has been satisfactory and would more than counterbalance the risk of an open operation. A Philadelphia surgeon many years ago remarked that antiseptic surgery is not cock-sure surgery even in the hands of the best men. This is yet true. If I had a fracture of the patella, I certainly would not have my knee-joint opened and the fracture sewn up. I would take my chances the other way and believe that I would come out pretty well. King Edward's patella was treated bloodlessly and wisely.

Infant Mortality—The young of all animals are more susceptible than the adult to the influence of environment and the approach of death. Owing to the long duration of the period of infancy in human beings as compared to that of the lower animals in general, it is obvious that the opportunity of environment to react on our development is enormously increased over that afforded in the case of other living beings. Hence it is inevitable that even under the most favorable circumstances, the deaths of infants will furnish a large contribution to the bills of mortality. But when it can be said of a city, as it can to-day be truly said of Boston, that, "the newborn child within its gates has less chance than a man of 90 of living for a week, less chance of living through a year than a man of four-score," there surely is connoted a prevalence in that city of those causes and conditions which in the long run determine a degeneration of the race. Poverty alone is not responsible. In many poor communities the infant mortality is low. Housing and external environment alone do not produce this evil, for under some of the worst external conditions in the world it is absent. The chief cause of infant mortality is to be found in that component factor of its environment which is more potent than any other of influencing the future development and determining the fate of the new-born babe.—J. M. Connolly in *Hygiene and Physical Education*.

BRAIN TUMOR*

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During the past year I have had the opportunity to observe a number of cases of brain tumor, certain features of which seem to me worthy of discussion. Especially noteworthy are the importance of gradually developing hemiplegia, the slow appearance of papilledema in certain cases of glioma, and later its remarkably rapid development, the resemblance of tumor of the pons to tumor of the Gasserian ganglion, and the signs of tumor of the occipital lobe, especially the dissociation of the color-sense in tumor of the left occipital lobe.

DIAGNOSIS OF BRAIN TUMOR

The credit for pointing out that progressive hemiplegia without other symptoms is diagnostic of brain tumor seems to belong to R. T. Williamson. In his paper[1] he states that it is well known that when hemiplegia is produced by a tumor in the motor cortex or white matter of one cerebral hemisphere the onset of the paralysis is usually very gradual. Day by day, and week by week, the loss of power becomes more and more marked. It may be weeks, or a few months, before the paralysis is complete. It is not so well known, he states, that progressive hemiplegia of the nature just described is an almost certain sign of brain tumor, even in the absence of optic neuritis, headache, and vomiting (provided there are no indications of cerebral abscess). Williamson reports three cases of brain tumor in which the hemiplegia developed very gradually, and in all three papilledema was absent. In the first case headache and vomiting were present; in the second case these two symptoms were absent for a long period; in the third case they were absent altogether. He refers to a similar case observed by him ten years previously. He expresses his views very clearly: "Provided there are no indications of cerebral abscess, progressive hemiplegia, or hemiplegia of gradual onset, in which weeks or a few months elapse before the paralysis is complete, may be regarded as strong evidence of cerebral tumor, even when optic neuritis is absent, or when optic neuritis, headache, and vomiting are all absent."

I can not refrain from stating that Williamson expresses his opinion somewhat too forcibly. A gradually developing hemiplegia I have seen as a symptom of polioencephalitis. A child recently under my care presented symptoms suggestive of brain tumor. An operation was performed at my request by Dr. Frazier and a portion of the cortex was removed, as at the operation it resembled tumor tissue. It proved to be the seat of polioencephalitis. Six weeks before the child came under my observation the right lower limb began to get weak, and one week later the right upper limb began to grow weak. The hemiparesis became gradually worse. The case I shall probably report in detail, and merely wish to call attention here to the fact that polioencephalitis as well as tumor may cause a gradually developing hemiplegia. The latter lesion is, of course, of much more frequent occurrence than the former.

Souques[2] also has recently written on gradually developing hemiplegia as a sign of tumor.

Cortical meningitis may cause a gradually developing hemiplegia, and the meningitis may be purulent or of other type. I have recently seen a case with Dr. W. G. Shields, Jr., and Dr. J. A. Hearst in which paralysis of the left lower limb, almost confined to the part below the knee, developed one day, and paralysis of the left upper limb and left side of the face did not appear until two days later. An operation by Dr. Edward Martin revealed a purulent meningitis, apparently confined to the region of the center for the lower limb. The paralysis in such a case, however, is likely to be of more rapid development than when caused by tumor.

The gradual development of hemiplegia was present in several of the cases mentioned in this paper. It was especially striking in Case 1, and, indeed, because of it I made the diagnosis of a probable tumor of the brain at my first examination of the patient. A hemiplegia had developed very gradually during a period of about six weeks, and there was at no time a sudden increase in the paralysis. Even within three days of death no changes in the eyegrounds were observed in an examination by Dr. de Schweinitz. A large tumor was found in the optic thalamus and internal capsule, and had undergone cystic degeneration. It had evidently caused no increase of intracranial pressure. Cases such as this and Cases 2 and 3 indicate that the production of papilledema by toxic substances alone in brain tumor is questionable. In all these cases the tumor was large, and yet papilledema did not occur, in two cases and developed only late in the other, probably because there was no great increase of intracranial pressure.

In Case 2 a gradually developing hemiplegia was observed, and yet the tumor did not extend to the internal capsule. Vascular changes in the internal capsule at a distance from the tumor caused the hemiplegia, as determined by the examination of certain sections given by me to Dr. Byrnes for this purpose. The importance of this finding is in the demonstration that a gradually developing hemiplegia in brain tumor does not imply necessarily that the tumor has extended to the internal capsule. The examination of the brain with the clinical notes in mind was a surprise to me, as to the naked eye no implication of the internal capsule could be detected, and the tumor evidently did not extend so far forward from the occipital lobe. Dr. Byrnes[3] has referred to these findings in another paper.

A gradually developing hemiplegia was observed also in Case 4, but the patient was not seen by me until the symptoms were far advanced, and it was uncertain how much reliance could be placed on the statements.

In a case seen by me in consultation with Dr. Babcock a diagnosis of brachial plexus palsy had been made at first, because the palsy seemed at that time to be confined to the upper limb. At the time I saw the patient the lower limb had also become affected, and other symptoms made the diagnosis of tumor a probable one. A cortical tumor was found by Dr. Babcock at operation.

I have in two instances known thrombosis of the middle cerebral artery to cause a gradual increase in the symptoms as seen in tumor, but when thrombosis is the cause the development of the symptoms is likely to be somewhat different. A partial palsy, or other symptoms indicative of brain lesion, may develop within a

* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.

1. Williamson, R. T.: Practitioner, July-December, 1904, p. 321.

2. Souques: Rev. neurol., 1908, p. 1250.

3. Byrnes: Jour. Nerv. and Ment. Dis., March, 1909.

short time, and then the symptom-complex may be arrested for some time, possibly several weeks, until the thrombus extends to one or more branches of the vessel previously affected, when additional palsy appears, but usually more rapidly than is seen when a tumor is the cause of the weakness. Occasionally a tumor may produce a very rapid palsy, as when a hemorrhage implicates the growth or when a glioma has destroyed many of the axis cylinders within the tumor but has left enough for the discharge of function, and suddenly, by edema or other cause, the impaired fibers become insufficient.

A peculiar symptom, present in Case 3, I have observed in two other cases of brain tumor, viz., intense hunger. Mrs. Y was hungry all the time and had a "most vigorous appetite," in the words of her friends. In another case a note was made that the patient had a voracious appetite. The intense hunger is not confined to tumor cases. The character of the tumor seems to have no bearing in the production of this symptom, nor does its location seem to have much importance.

Mrs. Y. (Case 3) also complained of pain and throbbing extending down the neck to the shoulders. Pain from tumor of the brain may be felt in the neck. This neck pain was very pronounced in a case reported by me some years ago, and in that case the tumor was at the foramen magnum and extended downward on the cord the distance of several cervical segments. Why pain should be felt in the neck from a tumor of the brain is not clearly understood, any more than is the related symptom of stiffness of the neck observed sometimes in cases of brain tumor, as in Cases 1, 2 and 4, in which rigidity of the neck muscles was caused by a tumor of the optic thalamus, by a tumor of the occipital lobe, and by a tumor of the region posterior to the optic thalamus. So far as I am able to determine, pain radiating down the neck and stiffness of the neck are not of localizing value.

The slow development of papilledema in glioma is worthy of comment. It may be absent throughout the disease, even when the tumor is large, as in Case 2, in which almost the entire occipital lobe of one side was occupied by a tumor, or in Case 3, in which it developed late, and after the tumor had attained a very large size. The latter case demonstrated another interesting phenomenon, viz., the occasionally extraordinarily rapid development of papilledema in brain tumor, even though it may be late in appearing. This patient was found on March 21 to have normal eyegrounds; on April 6 Dr. Thorington noticed for the first time that the nasal side of each disc had begun to be elevated and to be indistinct in outline, and that the retinal veins were enlarging. On April 13 he found the swelling of the discs to amount to 7 D., and on April 18 to 10 D. The case shows how important constant observation of the eyegrounds may be when the symptoms of brain tumor are present, and illustrates the danger of delaying decompression when the signs of increased intracranial pressure appear. It is often impossible to make the patient realize that the sight may be put in jeopardy within a few days, and he may neglect to visit the ophthalmologist, notwithstanding that every effort may have been made to convince him of the danger of this neglect.

Paton[4] has studied the records of 252 cases of brain tumor occurring at the National Hospital between the years 1899 and 1905. He finds that tumors of the deeper portions of the cerebral hemispheres and of the pons are more likely to occur without papilledema. In the subcortical cases the development of papilledema almost invariably corresponded with invasion of the cortex or with marked compression or invasion of the lateral ventricle. The development of papilledema in pontile tumors almost invariably implied the invasion of the cerebellum.

In the discussion of this paper Gunn[4] states that pontile tumors rarely cause papilledema because death occurs early.

The statements quoted from the remarks of Paton conform with the results of my own observations in great measure, but the explanation offered by Gunn for the infrequency of papilledema in cases of pontile tumor is inadequate. I have repeatedly seen tumors causing enormous enlargement of the pons before death occurred, and in Case 3 the tumor of the pons doubtless was enormous before papilledema occurred. The cerebellum was not implicated, and, notwithstanding Paton's statement, papilledema became intense. Likewise, in Case 2, the tumor occupied almost the whole of the occipital lobe, but caused no papilledema, even though it extended to the cortex. Rules are useful, but almost all have exceptions, and what is true of one series of cases is not true of all.

Some years ago Schmidt[5] advanced the view that an increase of the symptoms by lying on a certain side of the body was indicative of the side of the tumor. The sign has seemed to me exceedingly unreliable, and I have been observant of it since the first appearance of Schmidt's paper, but have never been able to obtain any satisfaction from it, and have come to entirely disregard it from a diagnostic point of view. Mrs. Y (Case 3), for example, was obliged to lie on the right side, and when she turned on the left side she complained of feeling sick and as if "everything were going from her." Turning the head to the left while lying down produced nausea. In this case the tumor implicated the entire pons.

In Case 5 the diagnosis had to be made between tumor beginning in the Gasserian ganglion and tumor of the pons. The patient had headache, vomiting, vertigo when headache was present, and diplopia. In my examination I found that he had considerable ataxia, slight nystagmus in looking far to either side, slight weakness of the left facial distribution, some impairment of hearing in the left ear, and marked paralysis of the left trigeminal nerve (atrophy of the temporal and masseter muscles with diminution but not complete loss of sensation in the distribution of this nerve) and paresis of the left side of the soft palate.

One might readily diagnose a tumor of the pons with these symptoms, but the examination also showed that the voluntary power of the upper and lower limbs on each side, as well as the tendon reflexes of these limbs, was normal. The ocular examination revealed beginning papilledema and paresis of the left external rectus. The deafness of the left ear was attributed to catarrh, as no signs of nerve deafness were detected.

Probably the most striking sign was the pronounced implication of the left trigeminal nerve, so intense as to cause a distinct flattening of the face over the position of the muscles supplied by this nerve; and this would seem to indicate a long-standing implication of the fifth nerve. A tumor of the Gasserian ganglion would explain this sign, as well as the escape of the motor tracts for the lower limbs. The left sixth nerve

4. Paton and Gunn: Tr. Ophth. Soc. U. Kingdom, 1907-1908, xxviii, p. 112.

5. Schmidt: Wien. klin. Wchnschr., 1898, No. 51.

might easily be caught in its passage through the cranium. Pressure of the tumor on the pons—i. e., on the middle cerebellar peduncle—might explain the nystagmus on lateral movement and the ataxia. A tumor in this position might cause some weakness of the left facial nerve and beginning deafness. I am inclined to think that central deafness at first may be indistinguishable from deafness due to middle-ear trouble, and that we should be careful how we diagnose when deafness is in an early stage. The weakness of the left soft palate was difficult to explain by the supposition of a tumor beginning in the Gasserian ganglion and extending downward sufficiently to implicate the glossopharyngeal nerve, but no less difficult appeared the diagnosis of tumor within the substance of the pons sufficiently large to implicate the fifth, sixth, seventh, eighth, and possibly the ninth and tenth nerves, and yet cause no weakness of the limbs or change in the tendon reflexes. The diagnosis was extremely difficult and could not be made with certainty, and, in the hope that the tumor might be found in the region of the Gasserian ganglion, although pain in the face had not been severe, I requested Dr. Frazier to operate, but the tumor was not detected at the operation. It is indeed remarkable that a tumor so large as that found in this case could occupy a large portion of the pons and yet produce no weakness of the limbs or change of reflexes that could be detected in careful examination directed toward the finding of either of these signs. The explanation is that the growth was a glioma, and, as so often occurs in tumors of this variety, many nerve fibers passed through the tumor without losing their axis cylinders, even though they may have lost their medullary sheaths. Pain in the distribution of the fifth nerve would be more likely to occur in tumor of the Gasserian ganglion.

The case shows clearly that the diagnosis between a tumor upon the pons and one within the pons, if the latter be a glioma, my be extremely difficult or even impossible. A case presenting the same difficulty I studied with Dr. W. A. Bliss in St. Louis somewhat over a year ago.

In my chapter on tumors of the brain, in the book edited by Dr. Posey and myself,[6] I give the symptoms that have been observed in tumors of the occipital lobe. Visual hallucinations are mentioned, and several references are given to cases in which these phenomena occurred. The hallucinations seem to occur in the blind fields, and this statement is also made by Oppenheim.[7] The appearance of homonymous lateral hemianopsia, followed by gradually developing hemiplegia and loss of sensation, all the symptoms being on the same side, is suggestive of tumor, especially if the hemianopsia be accompanied by visual hallucinations. The latter may be absent throughout the course of the disease; thus Claude and Rose[8] have recently reported two cases of tumor of the occipital lobe in which visual hallucinations were not observed. They assume that such hallucinations are caused by irritation of the calcarine cortex, and were absent in their cases because the tumors were in the white matter of the occipital lobe. This seems to be assuming too much, as we have sufficient evidence to show that a lesion need not be confined to, or even be located within, the calcarine cortex to produce visual hallucinations, and this statement is justified by Case 6. I have emphasized this fact also in my chapter referred to above. Claude and Rose refer to the fact that the hemianopsia in tumor of the occipital lobe is seldom complete from the beginning, but, after being partial for a time, may rapidly become complete, so as to suggest a thrombotic lesion. In one of their cases an examination made Jan. 9, 1907, revealed a left homonymous lateral quadrantanopsia. Another examination, made Feb. 24, 1907, showed that the hemianopsia had become complete.

All writers who refer to visual hallucinations in cases of brain tumor, so far as I have been able to study the literature on the subject, speak of the hallucinations as occurring on the side opposite to the tumor. This generally accepted opinion led me to a diagnosis of the wrong occipital lobe in a case seen with Dr. William H. Teller (Case 6). The patient stated positively that he had frequent attacks, in which wriggling bright lights, beginning always in the right field, gradually passed to the center of the field, and disappeared in the left field. These phenomena were accompanied by dimness of vision, beginning also in the right field and disappearing in the left field. Since optic neuritis had occurred he saw black objects looking like snakes, rosettes, and forms of leaves in front of the eyes; occasionally he saw the heads of persons. Believing from these phenomena that the tumor was probably on the side opposite the fields in which the hallucinations first appeared, and therefore in the left occipital lobe, I suggested to Dr. Teller that it would be well to expose the left occipital lobe. The tumor, however, was in the right occipital lobe. It would seem from this case that visual hallucinations may occur in the field on the same side as the tumor, or at least begin in this field. The patient was intelligent, his mind was active, and his statements regarding his visual phenomena were reliable.

The only important signs of tumor in this case were papilledema of high grade and visual hallucinations. Hemianopsia was not present, and the absence of this sign is explained by the examination after death, as the tumor does not appear to have implicated the visual fibers. It seems almost impossible to have made any other localization than that made in this case, unless we can judge from one case that visual subjective phenomena may occur in the field on the same side as the tumor.

Another case seen with Dr. J. T. Rugh more recently lends support to this view. A woman with signs of brain tumor saw flowers and "red, green and bright colors," and dogs, to her right, and on one occasion she saw bird-cages and an open trunk, but it is not certain where she saw these; the flowers and dogs she was sure she saw to the right. Spontaneous pain in the right parieto-occipital region and tenderness to percussion here, normal right patellar reflex and exaggerated left patellar reflex, and some impairment of ability to recognize objects with the left hand, indicated that the lesion was on the right side. The tumor was not found at operation, but the pressure of the right cerebral hemisphere through the opening was enormous.

Lewandowsky[9] refers to the amnesic color-blindness of Wildbrand. This seems to be a sensory aphasia confined to the names of colors. Patients presenting this sign are unable to name colors shown them and to pick out colors named to them. Lewandowsky is uncertain whether this symptom occurs in a pure form, and is

6. Posey and Spiller: The Eye and Nervous System, 387.
7. Oppenheim: Die Geschwülste des Gehirns, ed. 2, p. 120.
8. Claude and Rose: First Internat. Cong. of Psychiat., Neurol., etc., Amsterdam, Sept. 2-7, 1907.
9. Lewandowsky: First Internat. Cong. Psychiat., Neurol., etc., Amsterdam, 1907; Monatsschr. f. Psychiat. u. Neurol., 1908, xxiii, 488.

inclined to think that the symptom-complex belongs to his dissociation of the color-sense. His patient had sensory aphasia, was word blind and word deaf, but after these symptoms had almost disappeared the peculiar color-symptoms were detected. He had homonymous right lateral hemianopsia. Like my patient referred to below, the man was not mind-blind. My patient had no difficulty in recognizing and avoiding objects. Lewandowsky's patient was unable to name the colors of objects shown to him or to find colors named to him. He could not name the color of an orange or a leaf (my patient could not name the color of blood or of snow). He also could not find the proper colors of objects from samples shown him, as my patient also could not. The disturbance evidently did not depend merely on a speech defect. His patient also did not observe anything peculiar in pictures colored unlike objects occurring in Nature. *He was able to match colors.*

Lewandowsky believed that a lesion had destroyed the color-center of the left hemisphere, but that the color-center of the right hemisphere was preserved. The association of the color-sense not only of the left center but also of the right center was through the left color center, and, this being destroyed, association of color with form was impossible. Whether the left occipital lobe is the more important in every person is not determined, but in all reported cases of cerebral disturbance of the color sense the left hemisphere has been affected.

It would seem that in this dissociation of the color-sense described by Lewandowsky[9] we have a new and important sign of lesion of the left occipital lobe. It is possible that it might occur without other sign of lesion of the occipital lobe, but it is probable that we shall always find hemiamblyopia, as in my case, or even hemianopsia.

A patient in the service of Dr. John H. Musser, whom I had the opportunity to examine, presented this symptom of color disturbance, which promises to be of value in diagnosing lesions of the left occipital lobe. It is not my intention to enter into a full description of the case in this place. He had right lateral homonymous hemiamblyopia, intense word-blindness, slight word-deafness, and some amnesic aphasia, i. e., he could not always find the word he desired in speaking. As there was a possibility of tumor, although the lesion was believed to be thrombosis, I recommended exposure of the left occipital lobe with the angular gyrus as a center, and softening of the occipital lobe was found by Dr. Frazier and the diagnosis confirmed by the examination of a small piece of excised tissue. An examination made by me before the operation gave the following results:

The patient could name most objects shown to him, such as a watch, knife, key, handkerchief, but sometimes made mistakes. When shown the picture of a dog colored deep blue or the picture of a donkey colored deep green he found nothing peculiar in these colors, and said when asked that he had often seen a dog or a donkey of the colors mentioned. He was entirely unable to give the name of any color shown him, and when the correct name of the color was mentioned among others he did not recognize it. He could match colors without the slightest hesitation. He was entirely unable to find a color mentioned to him when a variety of colors was placed before him. He was unable to name the color of any object shown to him, as that of a leaf. He answered, "I know what all that is, but I can not remember." When asked what a leaf was he said that he did not know.

A hasty examination would have led to the conclusion that the patient was color-blind, as he did not remember the color of any object, did not name the colors shown him, did not see any impropriety in the coloring of a dog blue or a donkey green, and yet the preservation of the color-sense was shown by his ability to match colors without the slightest hesitation. He had merely lost the ability to associate color with form; he recognized the form of most familiar objects and matched colors, but was entirely unable to put form and color together. He had what Lewandowsky has described as *Abspaltung des Farbensinnes,* which might be translated as dissociation of the color-sense.

It is usually difficult or impossible to form an opinion of the character of the tumor from the symptoms. As regards the possibility of this, Oppenheim[10] says:

> The symptoms are not essentially modified by the character of the growth, especially when the syphilitic process is left out of consideration. The same symptom-complex may be produced by glioma, sarcoma, solitary tubercle, and other tumors. The glioma sometimes is characterized by apoplectiform attacks, which may occur repeatedly and be associated with a rise of temperature. The vascularization may cause much variation in the intensity of the symptoms. The glioma has a slow growth, excepting the acute attacks caused by hemorrhage and swelling. Remissions are not uncommon.

Ludwig Bruns[11] speaks of the uncertainty in diagnosing the character of the tumor from the symptoms, but he thinks that very acute commencement of symptoms, possibly after slight trauma, in a person previously apparently entirely healthy, is suggestive of glioma. Rapid variation in the intensity of the symptoms and sudden increase in the symptoms are also common in glioma, but occur in other forms of tumor. The diagnosis between glioma and sarcoma especially is difficult.

There is still another way by which we may draw conclusions regarding the presence of glioma: The general symptoms of brain tumor, associated with the signs of a widespread lesion as of the greater part of the pons, with the escape of important fibers situated within the lesion, as those of the pyramidal tract, should be indicative of glioma. In no other form of tumor is the escape of fibers within the tumor so likely to occur. In two of the cases reported in this paper the justification for this view is clearly presented (Cases 3 and 5).

REPORTS OF CASES

CASE 1.—*Patient.*—D. P. (Lab. No. 467) was referred to me Jan. 11, 1909, by Dr. S. W. Gadd. He had been well until six weeks previously. He denied venereal disease, and his wife had not had any miscarriages. A left hemiplegia had developed gradually, there had not been at any time a sudden loss of function, for example he was weaker at the time I saw him than he had been two weeks previously. He had not taken alcohol for twelve months, previous to this time he drank occasionally. He had not had headache, and gave no history of trauma. During the five days previous to his visit to me he had vomited almost every day. He had not had convulsions.

First General Examination.—The notes concerning his condition at my first examination are as follows: "Mentality is good, and he talks fluently. The sight has failed during the past two years. He has slight weakness in the lower left side of face, not in the upper part of face. The tongue is protruded in the median line. The left upper and lower limbs are weak, but he still has considerable power in these limbs. The biceps and triceps tendon reflexes are a little exaggerated on the left side. The patellar reflexes are prompt, and the left is distinctly exaggerated. Ankle clonus is present on the left side, but not on the right side. There is no hemianopsia.

10. Oppenheim: Die Geschwülste des Gehirns, ed. 2, p. 221.
11. Bruns, Ludwig: Die Geschwülste des Nervensystems, ed. 2, p. 260.

Sensations of touch and pain are less acute on the whole left side; in face, upper and lower limbs. He has marked tremor of the right hand. He drags the left foot when walking. He has no hemianopsia."

Second General Examination.—The change that occurred in this patient's condition between January 11 and February 6 was very great. An examination made by me on the latter date gave the following results: "The man is in stupor; he mutters constantly, and makes irrelevant remarks. Hiccough is pronounced. He lies with his head turned to the right and the neck is stiff. The palsy in the lower part of the left side of the face is distinct. The stupor prevents any careful testing of the power of the upper part of the face. It is impossible to get him to protrude the tongue beyond the lips, or to make him move the eyeballs on command. The reaction to light is present in each eye, but feeble. He moves the right upper limb freely. The left upper limb is completely paralyzed, is flaccid, and falls lifeless when elevated. The right upper limb is somewhat spastic. The biceps and triceps tendon reflexes are about normal on each side, although they may be a little prompter on the left side. He seems to feel pin-prick in the left hand. The left lower limb is completely paralyzed, and falls lifeless when elevated. The patellar reflex is about normal on each side. Ankle clonus is not obtained on either side, and the Achilles reflex is weak on the left side. The Babinski reflex is uncertain on each side."

Ocular Examination.—The notes dictated by Dr. de Schweinitz regarding the ocular condition are as follows: "Pupils dilate thoroughly with homatropin. Right disc shows no swelling or edema, outer half has atrophic pallor. No definite signs of previous neuritis. Central vessels are small. The right disc is similar to the left, but of better color. In both maculæ patches of retinochorioiditis."

The man's condition became gradually worse, and he died February 10, at 6 a. m., his temperature, which had been irregular while he was in the hospital, rising to 106 just before death. A tumor was found in the region of the right optic thalamus.

Autopsy.—When the ventricles of the brain were opened after death no excess of fluid was found within them. The right optic thalamus fluctuated as though it contained fluid, and when a horizontal section was made through the cerebral hemisphere a cyst was found in the region of the upper part of the right optic thalamus and inner capsule. Twelve c. c. of cloudy yellow fluid were collected from this cyst. The tumor caused considerable enlargement of the right side of the brain, as shown by a horizontal section through both hemispheres at the level of the upper part of the optic thalamus. At this level it measured 4 cm. from before backwards and transversely. The cyst occupied the entire center of the tumor, leaving a narrow wall of tumor tissue. The growth was well defined from the surrounding tissue to the naked eye, and did not have an infiltrative appearance, nor did it extend into the lateral ventricle, but was separated from it by about 2 cm. of what appeared to be brain tissue.

Histologic Examination.—Under the microscope the tumor had a papillomatous appearance. It was sharply defined from the brain tissue, but extended into it by numerous nests of cells. It was very vascular and many of the vessels were surrounded by a row of cylindrical or somewhat cuboidal cells, each having a nucleus at the end nearer the vessel, the cells resembling the lining cells of the ventricle. The vessels were limited by a row of endothelial cells and separated usually by a space from the surrounding row of columnar cells. The tumor contained much detritus and some fatty granular cells. It had the appearance of adenocarcinoma, and seemed primary.

A squamous-cell carcinoma was found in the esophagus, but it is questionable whether the tumor of the brain could be considered as a metastatic growth from the tumor of the esophagus, especially as it was of a different type of carcinoma, and was solitary in the brain. The necropsy was performed by Dr. Karsner.

A very similar tumor of the brain has been described recently by Kölpin.[12] It was papillomatous and was regarded as an adenocarcinoma. It resembled glandular tissue where the tumor processes were cut transversely. It was sharply defined from the surrounding nervous tissue, but caused no distortion of the tissue about it, so that the growth of the tumor was proportional to the destruction of the nervous tissue. Masses of detritus were found in the center of the tumor, whereas the center of the tumor in my case had become cystic and the tumor had caused enlargement of the hemisphere.

Primary epithelial growths of the brain, Kölpin states, are rare findings. They arise in the ependyma of the ventricles or the lining of the chorioid plexus and have a papillomatous formation. Kölpin refers to a number of reported cases. He believed that the largest of his tumors was the primary growth and that it originated in the ventricular wall, although such a connection could not be positively detected, any more than it could be in my case.

CASE 2.—*Patient.*—M. Sher. (Lab. No. 448) was admitted to the service of Dr. Edward Martin, at the University Hospital, April 23, 1908. I report the case with his permission. The patient's age was 53. The history of his illness was obtained from his wife. He was said to have been kicked by a horse in the head during the summer of 1907, but was not disabled at the time. He had not been sick during the past twenty-eight years, and he had not been a drinking man. He had been complaining occasionally for some months of headache, and his wife had noticed drowsiness, which gradually increased until he stopped work nine weeks previously. At that time he complained of severe headache in the left parietal region and seemed confused. The headache was persistent. During the four weeks previous to admission he had been in bed and was stuporous most of the time, though occasionally rational for short periods. The right arm was said to have become paralyzed four days prior to admission, and the right leg about a week before admission. The paralysis of the lower limb had developed gradually. Further investigation made the duration of the stuporous condition as given doubtful, and it seemed probable that it may have begun only a few days before he entered the hospital. When he entered the hospital he was stuporous all the time.

Ocular Examination.—Dr. Shumway made the following report: " Pupils are equal and respond to light. There is much mucopurulent discharge, obscuring the cornea. He has bilateral incipient cataracts. Retinal veins are full, but not tortuous. There is no blurring of the nerve edges, no neuritis. The eyegrounds show no gross lesions."

General Examination.—An examination by me April 25 gave the following results: "Once when he was told to show his teeth he did so, and the nasolabial fold appeared to be as deep on one side as on the other. When the face is pricked with a pin on either side the corner of the mouth is drawn up, and there is no distinct evidence of facial palsy. He has a tendency to repeat in a whisper what is said to him. Pin-prick evidently causes pain in the face. Tactile sensation can not be tested anywhere because of the mental state. He partially understands what is said to him. The neck muscles are distinctly rigid. The right upper limb appears to be completely paralyzed; pricking with a pin in this limb causes some movement of the left upper limb, but none of the right upper limb, and the pricking is not correctly localized. The right upper limb seems to have impaired sensation. The biceps and triceps reflexes are about normal in the left upper limb, but somewhat exaggerated in the right upper limb. Testing with a feeding-cup seems to indicate that the man has right hemianopsia. The patellar reflex is much diminished on the left side and is normal on the right side. The Achilles-tendon reflex is prompt on each side. The right lower limb seems to be completely paralyzed. Pin-prick causes no movement of this limb, but probably causes some sensation of pain, as the man moves his left limbs as though he were in discomfort, and yet pain sensation appears to be diminished in the right lower limb. The Babinski reflex is not obtained on the right side, the toes

12. Kölpin: Arch. f. Psychiat., xlv, No. 2, p. 595.

not being moved in either direction; it is probably present, though somewhat uncertain on the left side." Leucocytes were 12,400.

Course of Disease.—The important features of this case were a gradually developing right hemiplegia, probably right hypalgesia, right hemianopsia, rigidity of the neck, a temperature that varied from 100 to 101, and the absence of ocular changes. Dr. Martin performed an exploratory operation April 28. Nothing abnormal was found. The right upper limb moved in response to electrical stimulation in the motor area. The man died April 30.

Autopsy.—A tumor occupied the greater part of the lower half of the left occipital lobe. It extended almost to the inner capsule and had the appearance of an angioglioma.

CASE 3.—*Patient.*—Mrs. Y., aged 45 (Lab. No. 449), was seen by me March 23, 1908, in consultation with Dr. J. Thorington, by whose courtesy I report the case. Dr. Thorington sent the patient to me with the diagnosis of brain tumor, a diagnosis that seemed to me correct after an examination. My notes as taken from my case book are as follows:

General Examination.—"Mrs. Y. . . . has been complaining of vertigo about one year. When in bed she is obliged to lie on the right side; when she turns on the left side she feels 'sick and as though everything were going from her.' Her weight has decreased from 155 pounds to 121 pounds. Turning of the head to the left while lying down produces nausea. She

Fig. 1.—Case 1. Adenocarcinoma of the right optic thalamus and adjoining region.

vomits often in the morning. She has had pain in the muscles of the neck, and often a throbbing sensation in the frontal and occipital regions, especially when bending over. She is hungry all the time, and has a 'most vigorous appetite.' The menses are regular. The throbbing in the back of the neck is very severe and extends down the neck to the shoulders. She can not read unless the print is very large. She complains of kicking and jerking in her lower limbs, and can not lie down in the daytime because of this, and is kept awake at night by it. All symptoms began a little more than a year ago. The pain in the head is slight when she is sitting very still. She chokes when eating and swallowing, but if her attention is diverted she has no difficulty of this kind. She has three children, all healthy, and has not had any miscarriages. She complains of numbness all over both sides of the face, the numbness began on the left side of the face. The roof of the mouth also is numb. She has not had any pain in the face. She staggers on the street like a drunken person. Her behavior at times appears childish. The right pupil is a little larger than the left and both react to light, accommodation and convergence. She has marked nystagmus in looking to the right, and less in looking to the left, none in looking upward or downward. The nasolabial fold is slightly less distinct on the right side, when the face is at rest, but in showing the teeth or in drawing up either corner of the mouth separately, there is weakness of the left side in the whole distribution of the facial nerve. The right masseter is stronger than the left. Touch and pain sensations are normal in each side of the face. She has marked diminution of the conjunctival and corneal reflexes on the left side. She hears the voice and watch well on each side. The tongue when protruded sometimes deviates to the right, sometimes to the left, or is in the median line. The soft palate moves normally. The finger-to-nose test shows very little if any ataxia. The grasp of each hand is good. There is no impairment of voluntary movements in either upper limb. The biceps and triceps reflexes are exaggerated in each upper limb. Touch and pain sensations are normal in the hands and feet. Voluntary power is normal in the lower limbs. The patellar reflex is exaggerated on each side. The Achilles reflex is a little exaggerated on each side and about equally. There seems to be a slight Babinski reflex on each side, but it is uncertain. She has no ankle clonus. She sways very distinctly with the eyes open, and more so with the eyes closed, and during my examination she falls frequently toward the right. The gait is ataxic, and more so with the eyes closed." She presented on one occasion adiadokokinesis in the right hand.

Ocular Examinations.—A letter from Dr. J. Thorington, dated March 21, 1903, stated: "The ophthalmoscope does not reveal any pathologic changes at this time. The eyegrounds are apparently normal and the discs are not elevated. Vision in each eye is normal, and the refraction + 1.25 sphere, together with presbyopia." On April 7, 1908, Dr. Thorington wrote: "Yesterday and today I noticed that the nasal side of each disc has commenced to be elevated and indistinct in

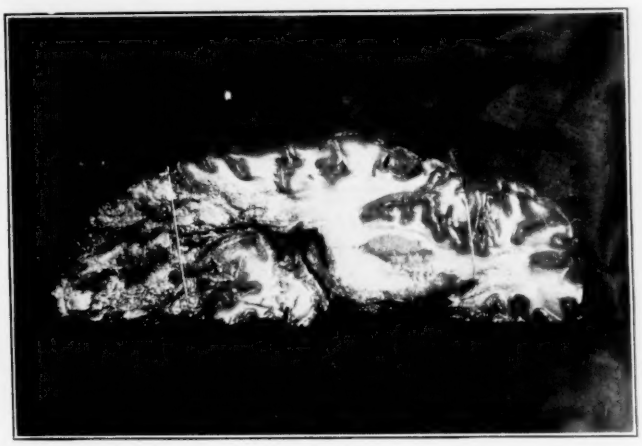

Fig. 2.—Case 2. Glioma of the left occipital lobe.

outline; the retinal veins are enlarging and becoming tortuous." Dr. Thorington reported that the swelling of the discs reached 7 D. on April 13 and 10 D. on April 18. Operation was considered, but as nothing more than palliation could be offered the relatives declined to have an operation. Death occurred May 4, 1908.

Autopsy.—A glioma occupied the whole of the pons. The left optic thalamus and adjacent region were much larger than the corresponding area of the right hemisphere. The lateral ventricles, especially the left, were distended. A microscopic section from the tumor of the pons stained by the Weigert method, showed few nerve fibers. The anterior pyramids were well stained by the same method.

CASE 4.—*Patient.*—D. T. (Lab. No. 422) was admitted to the Philadelphia General Hospital July 12, 1907.

History.—The patient had used alcohol, absinthe and tobacco to excess, but denied having contracted any venereal disease. He had been a clerk for twenty-five years. His symptoms began about ten months before his admission. He suddenly lost consciousness about thirty minutes, and six days later he had a similar attack which lasted three days. He could not describe these attacks more fully, but stated that he had had only two. He had had constant headache since the beginning of his symptoms, and it had varied in intensity, and was confined to the frontal region. He had been gradually losing power in his right upper and lower limbs, and his general vigor was impaired; he had lost his appetite and was unable to use his mental faculties as well as formerly.

First Examination.—His gait on admission was slightly hemiplegic, and he dragged the right toes. Sway was in-

creased by closing the eyes. The pupils were unequal, the left being slightly larger. Response to light and convergence was preserved. There appeared to be some weakness of the right side of the face in showing the teeth. Both upper limbs were weak, the right more so. There was slight tremor in both hands. The biceps and triceps reflexes were prompt on both sides. The right patellar reflex was slightly exaggerated, and ankle clonus was present on the right side. The speech was slurring, and test words were pronounced with some difficulty. His memory was poor, and he was easily confused. Soon after he entered the hospital he acted queerly, was dazed, attempted to disrobe in public, and did not know how to put on his clothing.

Second Examination.—Dr. Weisenburg, examining the man Sept. 18, 1907, noted that the right lower limb was contracted, and that the right upper limb was spastic. Right partial hemianopsia, and right hemihypesthesia were present.

Third Examination.—The man was examined by me Jan. 1, 1908. He was very stuporous, talked voluntarily, but irrationally. He heard when spoken to, but did not reply correctly. He had rigidity of the neck. The upper limbs were very rigid, especially the left. The upper limbs were adducted on the chest, with the forearms flexed on the arms, the left more than the right. The left palpebral fissure was larger than the right. The nasolabial fold was smoothed out on the left side. The biceps and triceps reflexes were restrained by the spasticity of the limbs. Although there was no distinct conjugate deviation, he had a tendency to turn his head to the right, but the eyeballs did not deviate. The legs were kept flexed on the thighs, the right as much as the left. They could be extended to an obtuse angle with the thighs. The spasticity was great and equal in the two lower limbs. Ankle clonus was persistent on both sides. Involuntary twitching occurred in the lower limbs.

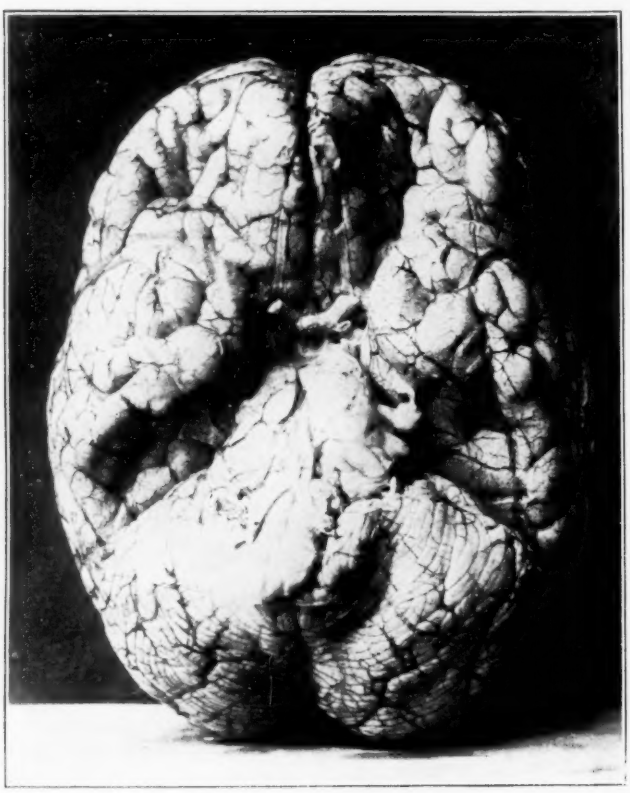

Fig. 3.—Case 3. Glioma occupying the entire pons.

Course of Disease.—At the time he came under my observation the symptom-complex was bilateral, and as much pronounced on one side as on the other. The history stated that the hemiplegia had developed gradually, but the left side seems soon to have become affected. Unfortunately no examination of the eyes was made; at least no record was made of any examination. It probably would not have revealed papilledema. The condition became gradually worse and the man died Feb. 2, 1908.

Autopsy.—The right optic thalamus was much larger than the left, and the enlargement was uniform. The left was concave slightly on its inner side to accommodate the enlarged right optic thalamus. The tissue posterior to the right optic thalamus had distinctly the appearance of a glioma, and the tumor was fairly well defined, especially where it projected as a rounded mass into the posterior horn of the lateral ventricle. No limitation could be placed to the anterior border of the tumor.

CASE 5.—*Patient.*—R. F. (Lab. No. 452) came into the University Hospital, July 23, 1908, referred by Dr. Rice. His age was 25. The notes taken at that time are as follows:

History.—"About nine months ago he began to have trouble with his eyes, his vision appearing indistinct and blurred. The disturbance has increased and for three or four months he has been seing double. The eyes ache a great deal. Shortly after the beginning of the visual disturbance he noticed that his lower limbs were unsteady, and the difficulty in walking has increased. Walking in the dark is especially difficult. During the winter he began to have severe headaches. At first these were daily, but they have become less frequent, until now he has them every three or four days. The severity of the headache has increased. The headache usually begins in the morning and lasts most of the day. He frequently vomits when he has a headache. The vomiting is not projectile, and he is nauseated when he vomits. Two or three months ago his speech became thick. He is dizzy when he has a headache if he attempts to move about. He is becoming a little deaf. He has never had convulsions, but a few times he has had a shaking of the left forearm. He has had some difficulty in passing the urine, but no disturbances of the bowels. He has not had any numbness. He has lost flesh. He denies venereal disease."

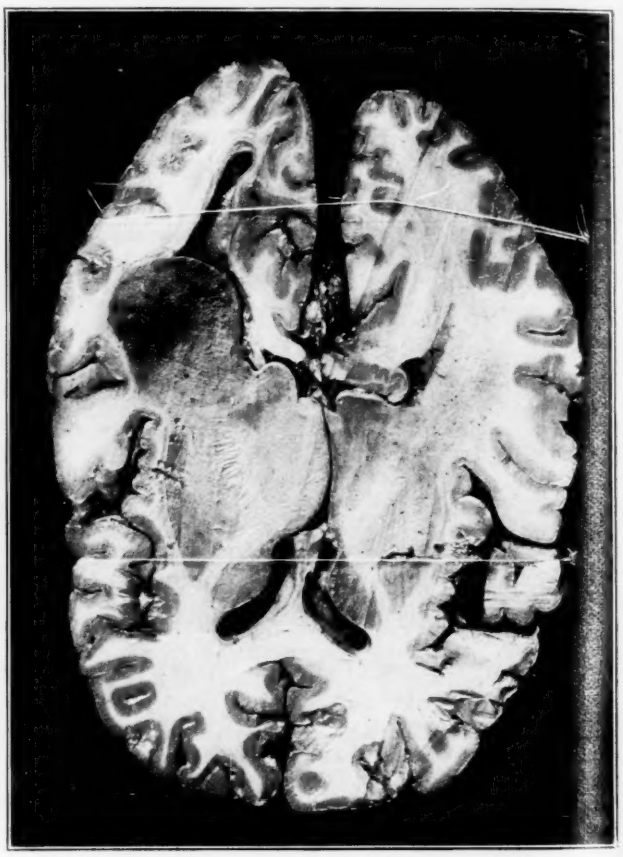

Fig. 4.—Case 4. Glioma in the region posterior to the right optic thalamus.

Examination.—This, made by me July 27, 1908, gave the following results: "In walking he staggers with the eyes open

or closed, and the tendency seems to be to go more to the left. His face has a smoothed-out appearance, like the face in paresis. He wrinkles his forehead well and about equally on the two sides, although possibly there may be a little weakness in the upper distribution of the seventh nerve of the left side. The left eyelids can be opened more easily when closed in resisting passive motion; the left corner of the mouth is a little weakened both in showing the teeth and in drawing up the corners of the mouth separately. The tongue is protruded slightly toward the right. He has slight lateral nystagmus in looking to the extreme right or left. The hearing of the voice and of the watch is distinctly impaired in the left ear, but the hearing may be imperfect also in the right ear. The left side of the face in the region of the temporal and masseter muscles is flattened as though these muscles were much atrophied. In biting there is no contraction in either the left temporal or left masseter muscle, and the man says that his teeth do not touch on the left side. The left soft palate is paretic. Tactile and pain sensations are diminished in the distribution of the left fifth nerve, but not lost. The left conjunctiva and cornea are almost anesthetic. The grasp of the right hand is about

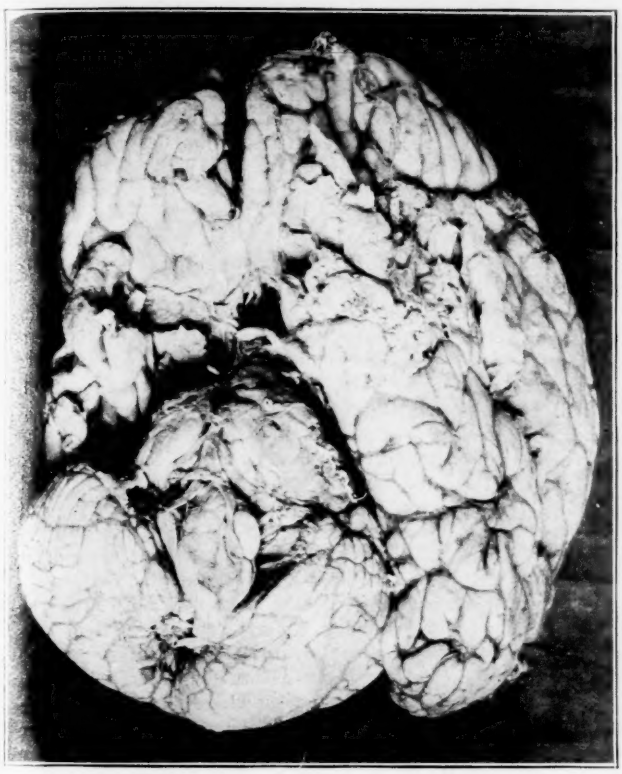

Fig. 5.—Case 5. Glioma of the left half of the pons and left half of the medulla oblongata.

equal to that of the left, and is fair. The biceps and triceps reflexes are about equal, possibly a little prompter on the right side. Tactile and pain sensations are probably a little diminished in the left hand, but this is questionable. The patellar reflexes are about normal. He has a slight Romberg sign. The Achilles-tendon reflex is prompt on each side, and about equal on the two sides. The voluntary power in the lower limbs is about normal." The patient stated at this examination that he had had a "touch-like" sensation in the left side of the face, but only when he touched the face, and he had never had any pain in the face. On another occasion it was stated that the right pupil was slightly larger than the left, both eyes reacted to light and in accommodation, but the response seemed to be slower in the right eye. In testing taste there seemed to be no impairment to sweet or bitter substances. The recognition of objects in the hands and the sense of position were intact. A report from the eye dispensary stated that there was beginning papillitis, more advanced in the right eye. The fields were concentrically contracted. The left external rectus was paretic. The reaction of the left seventh nerve as tested by Dr. McConnell was normal to the galvanic current. The left fifth showed a quantitative but no qualitative change. The left side of the larynx was found to move less freely than the right side. The deafness of the left ear was attributed to catarrh, and Dr. Butler, in Dr. Randall's clinic, was unable to find any signs of nerve deafness.

An operation was performed by Dr. Frazier in the hope that a tumor in the region of the Gasserian ganglion might be found, although such a finding might be doubtful. Decomposition might be of benefit, and save the sight. It was the only chance offered to the patient for relief, and proved to be ineffectual.

Autopsy.—A tumor occupied the entire left half of the pons, the right half appearing normal to the naked eye. It involved the entire left half of the medulla oblongata, causing much enlargement corresponding to the great increase in size of the left half of the pons. The right half of the medulla oblongata appeared to be normal to the naked eye. The left cerebral peduncle was not enlarged. No tumor was found in the left Gasserian ganglion, and this ganglion seemed to be in good condition. A microscopic section of the medulla oblongata showed that the tumor invaded the right side. Nerve fibers were found in all parts of the section, but the tissue was rarefied as though the nerve fibers were pushed apart by the infiltrating glioma.

CASE 6.—*Patient.*—G. D. (Lab. No. 450), aged 50, was a patient of Dr. W. H. Teller, with whom I saw the case in consultation and by whose courtesy I report it. Syphilis was denied. The notes obtained March 18, 1908, are as follows:

History.—"Fifteen months previously while sitting on the porch he suddenly became aware of some visual disturbance, but was not unconscious, he could not see plainly, could not hold a pencil properly, could not say the words he desired to say; he was able to walk, he vomited, had severe pain over the entire head, slept badly the following night, but the next day

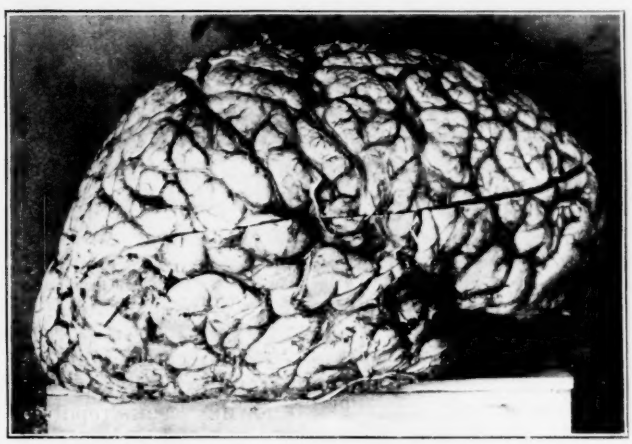

Fig. 6.—Case 6. Glioma of the right occipital lobe, indicated by a line.

he returned to work. He has not had any vomiting since that time. During the past three weeks he has seen objects before his eyes resembling snakes."

First General Examination.—"Pupils are equal; the reaction to light and in convergence is preserved; there is no nystagmus; no disturbance of tactile or pain sensation in the face. The patient can wrinkle the forehead, close the eyelids and draw up the corners of the mouth well on each side; the tongue is protruded in the median line; he hears the voice distinctly in each ear. The finger-to-nose test shows no incoordination; the power is good in both upper extremities, as is also sensation for touch and pain. The patient recognizes objects in either hand with the eyes closed, and has no impairment of the sense of position. The triceps and biceps reflexes are normal. The station and gait are normal with eyes open or closed. The patellar tendon reflexes are prompter than normal. The Achilles-tendon reflexes are prompt. Babinski's sign is not obtained. Sensation in the lower limbs is normal."

Second General Examination.—Notes taken on April 23, 1908, are as follows: "The right external rectus is weak.

There is no hemianopsia, no anesthesia of the conjunctiva, no weakness in the facial distribution of either side. Touch and pain sensations are normal in the face. Masseter and temporal muscles contract well on each side. Tongue is normal. Hearing of voice and watch is good in each ear. There is no area of tenderness of the scalp, no stiffness of the neck. The power of each upper limb is good. A slight Romberg sign is obtained at this examination. He has had frequent attacks in which wriggling bright lights, beginning always in the right field, gradually passed to the center of the field, and disappeared in the left half of the field; these attacks were with dimness of vision, beginning also in the right field and disappearing in the left field. Since he has had optic neuritis he has seen black objects like snakes, rosettes, and forms of leaves in front of the eyes, and sometimes he sees the heads of persons." In other respects the examination gave much the same results as obtained at the previous examination.

Ocular Examination.—Iridic reflex to light is slow, prompt in convergence. There is limitation in outward excursion in both eyes, especially to the right. No limitation in upward movement. Pupils: O. D. 2½ mm. O. S. 2¾ mm. Vision O. D. 10/20, O. S. 10/40. Marked papilledema, periphery 2D., center 7D. No hemianopsia. Fields are greatly contracted.

Operation.—Dr. Teller operated, as we hoped to find a tumor in the left occipital lobe, or at least produce a decompression that would benefit the patient. No tumor was found at the operation.

Autopsy.—A tumor measuring 3 cm. in length and 2 cm. from above downward was found in the lower part of the right occipital lobe. Microscopically it had the appearance of a glioma.

I am indebted to Dr. Alfred Reginald Allen for the photographs.

4409 Pine Street.

EXTENSIVE GLIOMATOUS TUMOR INVOLVING THE CEREBELLUM AND THE POSTERIOR PORTIONS OF THE MEDULLA, PONS AND CEREBRAL PEDUNCLE AND THE POSTERIOR LIMB OF ONE INTERNAL CAPSULE *

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PHILADELPHIA

Gliomatous tumors growing in the cerebellum are usually confined to it and only rarely do they extend into the adjoining parts. The following case is reported by itself because of the extraordinary growth of the tumor, which involved practically all parts of the cerebellum, but especially the inferior vermis, in an irregular manner all of the cerebellar peduncles, the posterior portions of the medulla oblongata, pons and cerebral peduncle, to a limited extent the posterior part of the optic thalamus and the posterior limb of the left internal capsule. The duration of the symptoms was about two years. The patient was under constant observation and the progress of the case was carefully observed, and some interesting observations were made in the progress of the symptomatology, the tumor evidently involving the cerebellum first and then growing into the cerebral peduncle and the medulla and then gradually implicating the posterior part of the pons. The growth was not properly diagnosed, but it was thought that there was a cerebellar tumor and an operation was performed over the right hemisphere. A part of it was removed for microscopic study. Definite cerebellar symptoms followed this removal.

REPORT OF THE CASE

Patient.—R., painter, aged 46. His family history was unimportant with the exception that both his father and mother died of Bright's disease. The patient had the usual diseases of childhood. He used tobacco moderately and alcohol to excess. He was a married man and had four living sons. There was no history of syphilis.

History.—The patient had been complaining for two years, his first symptom being headache, which was especially centered over the right parietal and occipital bones and back of the head. He was, however, able to work for a year, that is, until March, 1907, and then irregularly for about four months, ceasing then entirely. From this time until his death, which occurred in May, 1908, or about one year after the greater intensity of symptoms, he was under observation either in the dispensary or hospital. The headache was constant and of a dull character, being very great at times, increased by movement and not made better on lying down. A few months after the onset of the intense headaches, he began to be dizzy, describing the sensation as if he were rotating around the object at which he was looking. This dizziness became so intense that from the first he was compelled to have assistance in going up and down stairs and in walking, his gait being like that of a drunken person. Soon after this he began to be occasionally nauseated in the morning, this being accompanied by vomiting, later becoming more marked. In a short time he began to complain of general weakness, insomnia and nervousness, and then noticed that he had some difficulty in talking, which consisted in an increasing thickness and slurring in his enunciation, being worse at times.

Anteoperative Examinations.—When he first came under observation at the dispensary he complained only of the general symptoms of headache, nausea, vomiting and dizziness with general nervousness, and walked like a drunken person. The indistinctness and slurring in his speech soon developed and he complained of weakness in his vision, especially on the right side, and then began to see double, one object being above the other. At the same time there was a drooping of the right upper lid. Examination discovered only a general increase of the reflexes and weakness in looking to the right and no incoördination. There was at first no choked disc, but subsequent examinations made by L. Webster Fox demonstrated an increasing optic neuritis which was equally marked in both eyes, the height of the swelling reaching 7 diopters. The patient was then admitted to the Medico-Chirurgical Hospital under the care of Charles S. Potts. Examination demonstrated a distinct drunken, ataxic gait, the patient staggering more to the right. Station was also uncertain. The power in the upper and lower limbs seemed to be normal, the grip measuring by the dynamometer 90 in both hands. The tendon reflexes in the upper limbs were normal; in the lower slightly increased. There was no ankle clonus or Babinski on either side. Sensation was not disturbed. The finger-to-nose and heel-to-knee tests showed some ataxia, especially on the right side. There was no weakness of the muscles of the back. The cranial nerves were normal with the exception that there was some diminution of hearing, especially on the left side, and there was drooping of the right upper lid, with weakness in the right sixth and inferior oblique. The pupils were normal and there was no disturbance in their reactions. There was nystagmus on looking to the left and upward. Speech was thick and indistinct.

Operation.—A decompressive operation was performed over the right cerebellar area. The right cerebellar lobe was cut and tissue removed for microscopic examination, but nothing was found. The patient made an uninterrupted surgical recovery; his optic neuritis gradually subsided; although at first there were some hemorrhages, his headache, dizziness and nausea became less and slightly improved.

Postoperative Examinations.—Examination made by me about three weeks after the operation demonstrated that the patient's headache subsided at first but soon became more

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* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.

* From the Laboratory of Neuropathology, Medico Chirurgical College.

marked and about equally so on both sides of the head in the posterior portion. The nausea and vomiting were less after the operation. The dizziness subsided for the first three weeks and then became as marked as before. This was not present when the patient was in a recumbent position or when sitting, but when he suddenly turned his head to the right he had a sensation of swimming or lightness of the head which was not of a definite character. Turning the eyes in any direction also produced the dizziness. When he stood up the dizziness, especially of self, was extreme, and he also had a sensation as if objects in front of him were swimming. A more definite description of the dizziness could not be obtained.

The pupils were larger than normal, irregular in their outline, and their reactions both to light and to distance were sluggish. He always saw double, objects being one above the other, and he generally kept his left eye closed so as to avoid the diplopia. Nystagmus was present very slightly on looking straight ahead, but was mostly marked in looking to the right and to a less extent to the left and then upward and downward. Convergence was normally performed in looking downward and in the median line, but in looking straight ahead and upward not so well, but the attempt at convergence was not lost. There was a weakness of the right external rectus and right inferior oblique.

The patient could wrinkle his brow well on both sides, the folds being equally marked, but the right brow was distinctly weak. There was a marked drooping of the right lower eyelid and corner of the mouth, and the right orbicularis palpebrarum was weak. The right masseters and temporals did not contract as well as the left and when the jaw was opened it deviated to the right. Sensation for touch and pain over the distribution of the right fifth nerve was diminished. Smell was not altered and taste could not be tested. Hearing was diminished on both sides. Throat examination demonstrated sluggish movements of the soft palate and some weakness of the vocal cords on both sides. His speech was thick, indistinct and difficult to understand.

At first the patient had no paralysis, but when examined by me, he had a distinct weakness in the right upper and lower limb, this consisting in a diminished grip and resistance. The left limbs seemed normal in power. The tendon reflexes of both the upper and lower limbs were prompt and equally so. There was no ankle clonus or Babinski on either side, plantar irritation causing no movement of the large toes. The patient stated that he could feel touch and pain better on the left side of the body than on the right. This was also true for bone sensation.

The head was held in the median line and the protrusion of the hernia in the right cerebellar area was becoming more marked. When the patient sat up in bed the incoordination of the body could be easily noticed; he swayed in any direction, but especially to the right. He could not stand up himself, and when not supported he would fall, especially to the right. He could not walk alone, but with aid he had a drunken, ataxic gait, more marked to the right side.

There was distinct hemiasynergia and ataxia in the right upper and lower limbs, this not being influenced by closure of the eyes. There was very little ataxia in the left upper and lower limbs. There was no disturbance of the senses of position, movement, localization or pressure.

Later History.—From this time on until his death, May 5, 1908, about six months after the operation, the patient was chair-ridden. He gradually became more stupid mentally and it was with difficulty that he could be made to understand, owing partially to his stupidity and then again to the fact that his hearing became very bad, being worse on the left side. When sitting up in his chair he would have to be supported on all sides, otherwise he would fall in a heap. He could not voluntarily sit up and if left free for a moment his body would immediately fall. He had a habit of sitting with his head bent to the right, the chin near his shoulder, the whole right side of the body drooping. His headache became less, but his dizziness grew more marked, and while at first this was not present when lying quietly, toward the latter end of his life, even when in this position with his eyes closed he had a sensation of self moving to and fro. He preferred to lie on his left side because he said this made him feel somewhat easier. The nausea and vomiting subsided.

Gradually there developed a prominence of the right eyeball. The patient would constantly keep his left eye shut, so as to avoid seeing double, and when he opened his eye there was a constant to-and-fro jerking of his eyeballs. His pupils became very large and their reactions both to light and movement were ultimately lost. It was with difficulty toward the last that he could be prevailed on to move his eyeballs or perform any movement. The weakness in the distribution of the right seventh nerve became more marked, especially in the lower part, and the right fifth nerve was involved both in its motor and sensory portion. The tongue could not be protruded more than beyond the lips; its movements were weak and it deviated to the right. The patient's speech became increasingly thick and indistinct. His eating became impaired because it was difficult for him to chew and he could not swallow readily, choking quite frequently. During the two months before his death there was constantly dribbling of saliva and his speech became unintelligible.

The weakness in his right upper and lower limbs became more marked and toward the end there was also some weakness in the left side, especially of the lower limb. The ataxia became gradually more distinct and the asynergic movements were earlier and more quickly demonstrated in the right limbs. There was also ataxia in the left limbs. It was especially noticeable that as long as the mentality was fairly good the tonicity in the lower limbs was about normal, but with the decrease of his mental power the ataxia became more marked and there was present a considerable lack of tone. Toward the end he voided urine involuntarily.

Observations were made on his respiration and pulse for about a month before his death, but no changes were noticed.

Macroscopic Postmortem Examination.—The brain was removed the following day. The right lateral lobe of the cerebellum was soft, this being the point of the operation. From gross examination before cutting, no enlargement was found of the peduncles, pons or cerebellum.

Microscopic Examination.—Sections were made of the cerebellum, medulla, pons, cerebral peduncles, of different portions of the brain and the spinal cord. An infiltrating gliomatous tumor was found, this implicating both lateral lobes of the cerebellum, especialy the left, and practically all parts of the vermis. The growth involved all the cerebellar peduncles in an irreguar manner, the posterior portion of the medulla almost as low down as the pyramidal decussation, the posterior part of the pons and cerebral peduncles, especially around the aqueduct of Sylvius, extending toward the cerebrum into the optic thalamus and involving the extreme posterior portion of the posterior limb of the internal capsule on the left side.

The growth was rich in cells; some nuclei were larger than others, being round, oval or spindle-shaped. They stained darkly and were granular. By the ordinary acid stains little intercellular substances could be seen where the cells were dense, but in other parts fibers could be made out, especially on the border of the growth. In parts, especially around the aqueduct of Sylvius, the vermis and the left lateral cerebellum, the cells were very dense and packed tightly together. There was no definite border to the growth, as tumor cells could be detected considerable distance away from the main mass. The vessels within the growth were thickened and had undergone in places hyaline degeneration.

Cerebellum: The size of the cerebellum was not increased. In practically all portions of the vermis, but especially in the inferior lobe, the cellular infiltration was intense. The left lateral lobe was infiltrated more than the right and infiltration was greater in the parts around the intrinsic nuclei and became less as the cortex was approached, but tumor cells could be seen in all portions.

Medulla: Sections of the medulla showed a broadening of the anteroposterior diameter. There was no degeneration of the motor fibers on either side. The growth involved the parts around the fourth ventricle. On the right it was considerably larger and infiltrated the nucleus cuneatus and gracilis and partially the restiform body. It implicated also the nuclei of the eighth, ninth, tenth and twelfth nerves and to some

extent the nucleus ambiguus. The nerve cells, however, of these nuclei were not altogether destroyed, as here and there cells could be seen. The intramedullary portions of the twelfth, ninth and tenth, and eighth nerves were not degenerated, although tumor cells infiltrated parts of the fibers. On the left side, the infiltration was less, but here also the twelfth, ninth and tenth, and eighth nerves were partially involved, as were also the nucleus cuneatus and gracilis.

Pons: Sections made of all parts showed a broadening of the anteroposterior diameter, this becoming greater as the upper part was approached, the greatest broadening adjoining the cerebral peduncles. The growth was centered around and especially in front of the aqueduct of Sylvius, distorting it out of shape. Both sides were equally involved. The nuclei of the fifth nerves on both sides were implicated, especially the right. The nuclei of the sixth and seventh nerves were also involved, although all of the cells were not destroyed. The intramedullary portions of the fifth, sixth and seventh nerves were infiltrated in parts with tumor cells, but were not degenerated. Tumor cells could be found in the median fillet and to some extent in the anterior motor fibers. The posterior corpora quadrigemini, the superior cerebellar peduncles and the nuclei of the fourth nerves were almost totally replaced by tumor cells.

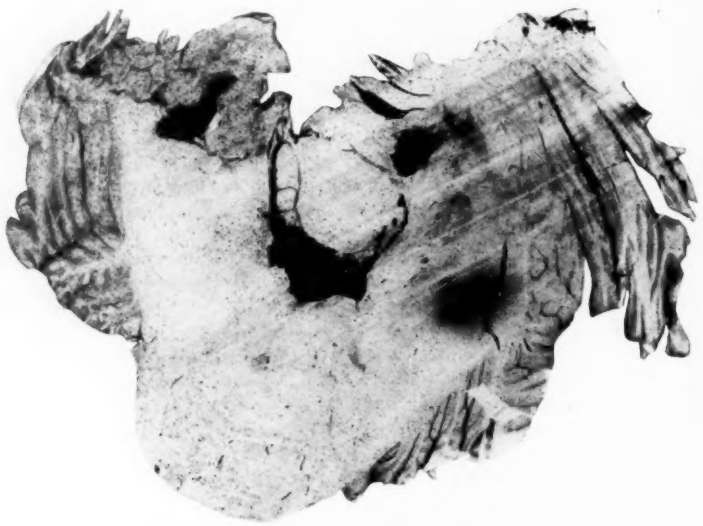

Fig. 1.—Section (actual size) cut through pons, middle cerebral peduncles and cerebellum. At the left, the site of the cerebellar operation can be seen. The tumor involves both cerebellar lobes, the left more so, all of the vermis and the posterior part of the pons. The left middle cerebellar peduncle is more involved than the right.

Cerebral Peduncles: There was no degeneration in the foot of the cerebral peduncles. The growth in this area involved the parts around the aqueduct of Sylvius, partially destroying the nuclei of the third nerves and the commissural fibers between them. The posterior part of the intramedullary fibers of both third nerves were implicated in the tumor. Both anterior and posterior corpora quadrigemina were involved, as were also the red nuclei, this being especially true on the right. Tumor cells could be found in practically all parts of the section. The antero-posterior diameter of the peduncle was increased.

Optic Thalamus and Internal Capsule: Some tumor cells could be seen in the posterior part of the thalamus and the growth involved the posterior portion of the internal capsule on the left side.

Cranial Nerves: Sections of the cranial nerves, with the exception of the first, showed some degeneration of the fibers. The right third and fifth nerves were more involved than the left, but in the other cranial nerves the degeneration was equal.

Spinal Cord: Sections were taken from the cervical, thoracic and lumbar cord and showed no degeneration. The nerve cells were normal and the anterior and posterior roots were intact and showed no degeneration.

Evidently the first symptoms observed were those referred to the cerebellum, such as headache, which was soon followed by nausea, vomiting, and a cerebellar gait in which the staggering was more to the right; then dizziness which was first described as if the patient were revolving around the object at which he was looking. He then began to have some difficulty in talking and in swallowing, and about the same time vision became impaired, although repeated ophthalmoscopic examinations did not demonstrate any choked disc, and it was not until about a year after the beginning of the headache that the neuritis made its appearance, rising then to 7 diopters. About the same time he began to see double, seeing one object above the other, and had drooping of the right upper lid. Examination demonstrated very little ataxia of the right upper and lower limbs, although the ataxia in walking was extreme. The patient also had a diminution of hearing on the right side. Because of the pressure symptoms, the cerebellar gait, more to the right, weakness of the right third nerve and the diminution of hearing on the left side, with difficulty in eating and talking, it was thought that he had possibly a cerebellar tumor, but the diagnosis was not clear because of the multiple cranial involvement on both sides.

An operation was performed over the right cerebellar hemisphere in which part of the right cerebellar hemisphere was removed and a whole group of symptoms developed directly after the surgical recovery. While before the operation there was not much ataxia and weakness in the right upper and lower limbs, this was marked afterward, and from then on until the patient's death, about five months later, the weakness progressed and the ataxia not only involved the right upper and lower limbs, but to some extent the left limbs. It was also noticeable that while before the operation there was no ataxia of the trunk muscles and apparently no weakness, afterward the patient could not sit up, but fell immediately in a heap and especially to the right. The reflexes were unaltered. For a short time he was able to walk, but his gait was distinctly ataxic and he staggered much more to the right. Alternate flexion and extension and other movements of the right upper and lower limbs were decidedly more incoordinate directly after the operation.

It is interesting to note that while clinically the preponderant cerebellar symptoms were on the right side, pathologically the left cerebellar involvement was greater, and that the vermis was more involved than either lateral lobe. It is probable, then, that the greater right cerebellar symptoms can be ascribed to the direct injury to the right lateral hemisphere at the time of the operation.

This is an interesting experiment on a human being and shows that the right cerebellar lobe controls coordination chiefly of the right limbs and also to some extent has an influence on muscular power. This has been demonstrated by other observers and has also been reported by me in a previous paper.[1] It is, however, interesting to note that while the ataxia and weakness developed in the right limbs, there was very little atonia and this did not make its appearance until the patient became stupid mentally.

The headache, nausea, vomiting and choked disc diminished gradually after the operation, but the dizziness

1. Weisenburg, T. H.: Diagnosis of Tumors and Other Lesions in the Cerebello-Pontile Angle, THE JOURNAL A. M. A., 1908, l, 1251

became much more intense. While at first he felt as if he were revolving around an object, he now developed a constant dizziness which finally prevented him from sitting up. At first he only had this when moving his head or eyes, but later it was also present when lying quietly. He described the dizziness as a sensation of swaying or swimming either of self or of objects.

In this case, as in others of mine, no deductions could be made from the type of the dizziness as to the location of the lesion. For a short time after the operation it was greater when looking to the right, but soon was equally marked in moving the head in any direction.

As the tumor involved successive portions of the cerebral peduncle, pons and medulla, some interesting symptoms were observed. At first the pupils were normal in size and reactions, but gradually they became larger and irregular, and their reactions to light and movement of the eyeballs became first impaired and then lost, the contraction of the pupils to convergence being retained longest. He developed palsy of the right sixth nerve and drooping of the right upper lid and weakness of the right inferior oblique. There were at first some nystagmoid jerkings in looking to the right and upward, but this may have been due to the weakness of the ocular muscles. Gradually the nystagmus increased, being always greater when looking to the right, less so to the left, and then upward and downward. Toward the latter end of his life the patient constantly kept his left eye closed because he saw double and there was a constant to-and-fro jerking movement of the eyeballs. At first convergence was normal in looking downward, somewhat impaired when looking straight ahead and more so when looking up. As the disease increased convergence became lost entirely, although for a long time the attempt at convergence was retained. It was also noticeable that he developed a protrusion of the right eyeball.

The above symptoms are referable to involvement of the oculomotor nuclei and are of extreme interest. It is presumable that the tumor grew slowly and that gradually the nuclei became diseased. While the growth involved all of the third nuclei many of the cells escaped and the absence of the total implication of the ocular muscles can be explained on this basis. It is interesting to observe that the reaction of the pupils to convergence was lost last. This is due perhaps to the fact that the converging movement is the strongest of the ocular movements and that greater musculature is involved, but it is probable, as I have already suggested,[2] that convergence has a distinct cortical center which is apart from associated ocular movements in any direction, and that just as there can be a paralysis of associated ocular movement upward, downward, to the right or left because of a lesion in the posterior part of the pons and crus, so there can be failure of convergence in similar directions. In the present case convergence was at first lost upward, impaired when looking straight ahead, and normal when looking downward. This I have observed also in other cases.

Nystagmus is fairly constant as a cerebellar symptom, although often I have found difficulty in differentiating between such nystagmus and that due to weakness of ocular muscles. The tendency is to describe any sort of jerking movements of the eyeballs as nystagmus, but I am inclined to differentiate and to ascribe cerebellar nystagmus only to that type in which there are to-and-fro or oscillatory movements irrespective of movement of the eyes, although they may be slightly increased by deviation. The so-called nystagmoid jerkings which are obtained only on looking to the right or left are in most instances due to a weakness of ocular muscles and it very often happens that this may be the first symptom of a succeeding paralysis of ocular nerves.

The protrusion of the eyeball is interesting and is difficult to explain. It has been observed in tumors in practically all parts of the cerebrum and cerebellum and no adequate explanation has as yet been offered.

Both the anterior and posterior corpora quadrigemina were implicated by the tumor growth, but it is difficult to ascribe any definite symptoms to such involvement. Lesions of the anterior corpora quadrigemina supposedly give disturbances of vision, but because of the presence of optic neuritis no deductions can be made. It is supposed that in the posterior corpora quadrigemina the central auditory fibers ascend to the temporal lobe. It was notable that there was disturbance of hearing very

Fig. 2.

Fig. 3.

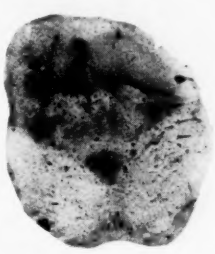

Fig. 4.

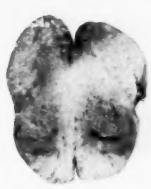

Fig. 5.

Figs. 2, 3, 4 and 5.—The cerebral peduncle, pons and medulla (actual size). Antero-posterior diameter in each is increased and the tumor mass can be seen around the aqueduct of Sylvius and the fourth ventricle in the medulla, staining darkly.

early, and while at first it was greater on the left side, it became markedly involved on both. Tests for hearing showed central deafness, but it is difficult to tell whether a lesion of the corpora quadrigemina caused the disturbance of hearing, inasmuch as both eighth nerves were partially diseased and their nuclei were also somewhat involved by the tumor.

While the growth involved the nucleus of the right fifth to considerable degree and to some extent the left, only the right masseter, temporal and pterygoids were weak.

At first the right facial nerve was involved in its whole distribution; that is, the patient was not able to show his teeth or wink his eye as well as he should, but later the weakness in the upper part of the face disappeared and there remained only the central type of facial palsy. This is difficult to explain, for, while Oppenheim[3] has described in tumors of the pons a weakness first of the central type which finally became peripheral, here we have just the opposite condition, in which at first the upper part of the face was involved as well as the lower, and later there was recovery of movement

2. Weisenburg, T. H.: Conjugate Deviation of the Eyes and Head and Disorders of the Associated Ocular Movements in Tumors and Other Lesions of the Cerebrum, THE JOURNAL A. M. A., March 23, 1907, xlviii, 1003, 1095.

3. Oppenheim: Lehrbuch der Nervenkrankheiten, ed. 3.

in the brow. Pathologically both nuclei were involved, the right distinctly more so, but not all of the cells were diseased, and it is possible that the recovery of power in the upper distribution can be explained by the fact that not all the cells were diseased and also that the cerebral fibers were not implicated.

Examination demonstrated a weakness in the palate and vocal cords; and all through his disease, but especially toward the end, the patient had difficulty in eating, talking and swallowing and dribbling of saliva. All these symptoms can be explained by the involvement of the nuclei in the medulla, although here, as in other nuclei, many of the cells escaped and there was not the weakness that was to be expected from the extent of the pathologic implication. It is also noticeable that there was no disturbance in respiration or in the action of the pulse. Records were kept daily for about a month before his death and observations were taken three times a day regularly.

The patient had some sensory symptoms, being able to appreciate objects better on the left than on the right. It must be remembered, however, that there was considerable involvement of the nucleus cuneatus and gracilis and parts of the median fillet in the pons.

No symptoms can be ascribed to the implication of the posterior limb of the internal capsule and the optic thalamus.

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ABSTRACT OF DISCUSSION

ON PAPERS BY DRS. SPILLER AND WEISENBURG

DR. MAX NONNE, Hamburg, Germany: It has been the generally received impression that the pulse rate in cerebellar tumors is lowered; but as I doubted by my own experiences the accuracy of this view, I spoke with some of the leading neurologists of Germany, asking their opinions on this subject; replies showed conclusively that, notwithstanding the traditional holding in this regard, the fact is that the pulse is as a rule normal in these cases, or if there is any change it is more often in the direction of acceleration. I should be very glad to learn the experience of American neurologists in this respect. The statements regarding it accord with my own experience.

I should like to call attention to one point in the diagnosis of tumors of the hypophysis, which for some reason has not been touched on, and that is the feminism which is often found in these cases. The voice resembles that of a woman or of an eunuch; the beard falls out, the hair on the genitalia disappears, the penis becomes shrunken and incapable of erection, while the testicles waste away. These symptoms are pointed out by all French and German authors as being of common occurrence in the cases in which the gland itself has been removed, and I have observed such a case clinically and microscopically. I should like a statement of the experience of American neurologists with reference to these symptoms.

DR. B. SACHS, New York: Evidently Dr. Nonne's experience tallies well with the experience of the majority of us here. As for the occurrence of feminism of which he speaks in case of tumor of the pituitary body, I think we have seen less of it here than is recorded in Germany and France. But in one of the cases which I saw of hypophysis tumor there was distinctly that appearance presented. I believe every one would be struck with such noticeable symptoms as the disappearance of pubic hair, wasting of the genitalia, etc., and that the symptoms would surely have been recorded if present. Far from failing to make a diagnosis of tumor of the hypophysis, one may sometimes make the diagnosis of tumor of this gland when the tumor is elsewhere in the brain; I had an instance of that sort not long ago illustrating this point; a woman was brought into my hospital service when she was near death from brain tumor. She presented all the symptoms that we ordinarily associate with hypophysis tumor, including even a double exophthalmos and some changes indicating an acromegalic condition. An attempt was made to save what little vision was possible by an exploratory operation, but the woman was in poor condition and proved to be one of the few who succumb even to an exploratory operation. We found that the tumor did not involve the hypophysis, but was in the parietal region. So that in rare instances all hypophyseal symptoms may be considered to be secondary symptoms due to pressure on the hypophysis instead of being indicative of a tumor actually involving the substance of the hypophysis.

In connection with the subject of optic neuritis or papillary edema there are unquestionably some conditions difficult to explain. It is difficult to explain why in some cases the optic neuritis appears so early and in others so late, and the condition appears most variable in connection with gliomata. In a patient who was under my direct observation for six years and on whom I had an autopsy performed, during five and one-half years of that period of observation there had not been the slightest trace of any optic neuritis. This was not only the conclusion arising from my own examination, but a most competent oculist repeatedly examined the patient and never found a single trace of optic neuritis. Yet when this man died, having had his tumor for six years and with convulsive seizures as the only symptoms of the tumor, it was found that he had a glioma almost completely filling one hemisphere, and yet no optic neuritis had occurred. The only explanation one can give of those cases is that under slow conditions of growth certain parts of the brain, possibly the optic nerve and the chiasm, accommodate themselves readily to increasing pressure, and the disturbance of function is therefore not so great nor the anatomic distortion so great as one would suppose it likely to be.

In reference to Dr. Weisenburg's point as to whether there is a possibility of making a differential diagnosis between nystagmus due to cerebellar symptoms and nystagmus resulting from insufficiency of the oculomotor muscles: I think there is a difference. First, the nystagmus I have seen in connection with oculomotor palsies has not seemed to me to be quite so rhythmical as that peculiar and rather rapid nystagmus which occurs in connection with lesions of the cerebellum and which I have now learned to associate altogether with an involvement of the dentate nucleus. When I see that peculiar form of nystagmus I naturally conclude that it indicates involvement of the dentate nucleus. We note not only the rapidity and regularity of movement, but also the fact that it seems to be associated with either movement in one direction or another rather than a movement that would seem to imply a defective use of one set of muscles or the other. But I think that this is merely a personal impression, and I should be glad to know whether others have been able to make any further differentiation.

DR. JULIUS GRINKER, Chicago: In line with Dr. Nonne's observation of feminism in hypophysis tumor, I am reminded of a case of acromegaly, probably due to tumor of the hypophysis, in which feminism was a conspicuous feature. In that case there was also infantilism. The patient was a man of 50 with sexual organs of infantile dimensions. The psychical make up was strongly feminine in type. I had one case in which, among other localizing signs, ataxia was present on the side in which the tumor was found. In that case there were, besides hypotonicity and adiocokinesis, signs which are mentioned as not frequently occurring in cerebellar tumor, but when present are considered of diagnostic value.

DR. THEODORE DILLER, Pittsburg, Pa.: I believe that it is the generally accepted view that in tumors of the cerebellum optic neuritis occurs much more frequently and constantly than it does in tumors of the cerebrum. Recently, through the courtesy of my colleague, Dr. Mayer, I saw a patient under his care who exhibited symptoms of cerebellar tumor, projectile vomiting and marked cerebellar gait, but optic neuritis was absent. Dr. Mayer felt convinced that there was a tumor, and operation was done and a tumor the size of a hulled walnut was found. I ought perhaps to qualify my statement that there was no optic neuritis. There was a slight suspicion merely in one eye which the oculist thought might not be incompatible with a normal fundus.

DR. FRANK WOODBURY, Philadelphia: What is the opinion of Drs. Spiller and Weisenburg of the relative frequency of the auditory phenomena in these cerebral tumors? Are auditory phenomena, such as tinnitus and hallucinations of hearing, common as compared with the ocular manifestations? In a case I studied a number of years ago the tinnitus was the most annoying and persistent symptom. The patient also had choked disc and optic neuritis with impaired vision and constant headache, but these symptoms were not so marked as the tinnitus, which the patient described as similar to blowing off steam from an engine, and declared it intolerable. At the postmortem a large growth was found behind the optic thalamus and projecting into the ventricle. It was decided that it was sarcoma and had followed a violent blow on the head some years before.

DR. JAMES D. PUTNAM, Boston: I think it would be the experience of all of us that the pulse is oftener fast than slow, although the contrary is occasionally seen, especially in tumors of rapid growth. With regard to the matter of the ataxia on one side in cerebellar cases, I recall an interesting confirmation of that fact, when the question was not of a tumor, but of an abscess of one side of the cerebellum; the ataxia was practically confined to one arm. I recall a case in which the pons at autopsy was found to be so soft that the greater part of it could be almost poured out, and yet within a few months the patient had been walking about the room and using both arms and legs fairly well.

DR. HUGH T. PATRICK, Chicago: I should like to confirm the opinion of Dr. Putnam that the rapid pulse in tumor is more frequent than the slow, except in rare instances. In fact, the other symptoms of tumor are so numerous and well pronounced that the pulse rate as a symptom of tumor may be neglected.

DR. D'ORSAY HECHT, Chicago: Almost all the references in regard to feminism in tumors of the hypophysis are to be found in the French and German literature. We have not recorded many observations on this point, although isolated case reports appear in some recent American contributions. Failure to include this phenomenon in my paper was rather a sin of commission for lack of time than one of omission.

DR. M. ALLEN STARR, New York: I can confirm the statement of Dr. Nonne that slow pulse is a rather rare symptom in these cases. I can also confirm the existence of hemiataxia on the side of the tumor in three cases of cerebellar tumor that have come to autopsy and in which that symptom had been very marked. In a case which I saw with Dr. Herman Knapp of New York, in which for several months before her death the ataxia of the woman had been extreme on one side while it was not so on the other, the tumor was found on the side of the ataxia. I have seen confirmed feminism in two cases of hypophysis tumor accompanied by acromegaly. One patient was exhibited before the New York Neurological Society some years ago; the man, who had all the typical symptoms of acromegaly, confided to me subsequently (although he did not wish it known) that his sexual organs had practically withered and that he had lost his pubic hair. His mental type was markedly changed. I watched him for seven or eight years, and his make-up at the end of that time was wholly different from that at the beginning of the disease and would conform entirely to the term used by Dr. Nonne.

I have come to the conclusion (and I think it can be borne out by autopsy records) that the existence of choked disc is wholly dependent on the existence of an effusion into the ventricles of the brain. If there is effusion of fluid into the ventricles and generally a hydrocephalic condition there will be choked disc; without this effusion it will not be present. I have in mind a case of an intimate friend of mine, a boy who grew up with me, and whose mental characteristics I knew intimately, whom I watched through the course of a brain tumor for four years, in whom the diagnostic points of brain tumor were absent. The question was for a long time considered whether he had paresis. At the autopsy, which I made myself, it developed that the right frontal lobe up to the ascending frontal convolution, was a mass of glioma. Yet that man had absolutely no choked disc up to the day of his death. He had occasional convulsions; he had no paralysis; there were many mental symptoms present. I have recently seen a patient with a rather extensive glioma of the occipital lobe involving the same distribution shown in one of the specimens passed, in which there was absolutely no choked disc whatever. The tumor, however, had not encroached on the posterior horn of the ventricle, and there was no distention of the ventricle. I think those of us who see many cases of brain tumor at autopsy will agree that if a tumor does not touch the ventricle, when it is a tumor of the hemisphere, or if it is located in such position as not to displace the cerebral axis, so as to cause stasis of fluid in the ventricles, it may exist for a long time without choked disc; but a very small tumor in such location as to interfere with the free exchange of fluid in the ventricles, for instance, underneath the corpora quadrigemina, will cause choked disc to appear early. The early appearance of choked disc is because the tumor interferes with the free passage of fluid through the ventricles and downward.

A point with regard to the diagnosis of the variety of tumor: I agree that in glioma there may be a preservation of many of the functions of the brain, although the glioma lies in a situation where one would expect them to be suspended. One common characteristic of glioma, as distinguished particularly from the harder tumors, is the great variability in the degree of the symptoms. These may be affected by applications of heat to the head or by hot foot baths. The variability of symptoms may be explained by the difference in the degree of the congestion of the tumor; we know that glioma is a very vascular tumor. Deafness on both sides is to my mind very rare indeed in any form of brain disease. I have one case to which I have already alluded, in New York, of bilateral sudden deafness from lesion of the pons, but I still believe it to be a unique case.

DR. WILLIAM G. SPILLER, Philadelphia: We in America also believe, with Dr. Nonne, that papilledema is a very common sign of brain tumor; but occasionally and perhaps more frequently in glioma than in any other form of tumor, papilledema may entirely fail even to the last stage. The existence of the ataxia on the side of the tumor of the posterior cranial fossa has been demonstrated by numerous cases. The same is true of any lesion in this region.

A case was referred to in the discussion in which the symptoms lasted a very short time. A few years ago I saw a case with Dr. J. W. McConnell in which the first symptom of tumor developed six weeks before the man died. A glioma was found occupying almost one entire cerebral hemisphere.

Nystagmus caused by lesion of the third nucleus, to which Dr. Weisenburg has referred, is probably indistinguishable from that caused by a lesion of the cerebellum, owing to the close connection of the parts; but if the lesion be in the third nerve nystagmus so produced should be distinguished from that caused by a lesion of the cerebellum, as is that caused by a lesion in the sixth nerve when weakness but not complete paralysis of the right abducent muscle exists. The patient looks toward the right, but his eyeballs return because of the weakness, and repeated innervation of the weak muscle causes a jerky movement of the eyeballs resembling nystagmus.

DR. T. H. WEISENBURG, Philadelphia: I have not observed alterations in the pulse rate as a frequent symptom in brain tumor. In the case just reported in which there was great pressure, there being choked disc of 7 diopters, and in which the nuclei of the ninth and tenth nerves were partially involved, there were no variations of the pulse and respiration, although observations were made three times a day for a month before death. I have repeatedly had difficulty in differentiating nystagmus due to an ocular lesion from what I consider pure cerebellar nystagmus. In discuss this in my paper and think that often a greater nystagmus is described when looking to one side, it being ascribed to the fact that the lesion is on that side, when it is really a symptom of weakness of an ocular muscle.

In the present case there were no auditory hallucinations, but it is not at all infrequent to have such symptoms in cerebello-pontile tumors, especially in those which grow from the eighth nerve. I know of no reported cases in which auditory symptoms occurred as the result of involvement of the central auditory fibers.

THE ANTIBODIES IN TUBERCULOSIS AND THEIR RELATION TO TUBERCULIN INOCULATION AND VACCINATION *

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The antibodies of tuberculous patients have been studied by a number of investigators. Arloing discovered a means of obtaining a fluid homogeneous culture of tubercle bacilli. This rendered it possible for him, with Courmont,[1] to study the blood and exudates of tuberculous individuals for their agglutinating action on tubercle bacilli. They found that the serum of many tuberculous patients and the fluid in a large percentage of the cases of pleuritic exudation due to tuberculosis agglutinated tubercle bacilli. This test is termed the serum reaction for tuberculosis. It is said by Courmont to agree quite closely also in positive results with the tuberculin reactions obtained from individuals apparently not tuberculous.

Koch[2] studied the agglutinins of tuberculous serums by a modification of the Arloing[3] technic. He believed that a parallelism existed between the agglutinin content of the blood and immunity in tuberculosis.

Jürgens,[4] on the other hand, investigated the blood of tuberculous patients recovering spontaneously. He was unable to trace any association between their improvement and their quota of agglutinins.

After the discovery by Bordet and Gengou[5] of an indirect method for demonstrating the presence of antibodies by a process known as complement fixation, they applied this principle to the study of antibodies in the blood of guinea-pigs that had been inoculated with killed human tubercle bacilli. They employed an emulsion of tubercle bacilli as antigen and found that the serums of the inoculated animals contained an antibody that would unite with antigen and bind complement.

These complement-binding antibodies were investigated both in animals and in man by Wassermann and Bruck,[6] who used a modification of the Bordet method. They examined extracts of tuberculous tissue both from guinea-pigs and from man and were able to demonstrate that these extracts contained both tuberculin and an antibody, to which they gave the name antituberculin. They examined the blood of tuberculous patients and in 13 of them, who had not received tuberculin inoculations, were unable to find any complement-binding antibodies. On the other hand, they reported that the blood of eleven tuberculous patients who were being treated with tuberculin contained antituberculin.

They observed that the first series of patients reacted strongly to tuberculin injections, but that the second failed to do so. They attributed the occurrence of the reaction in the first instance to the fact that there were no antibodies in the blood, and that as a consequence the tuberculin was attracted into the focus by the antituberculin existing there free; that as a result of these uniting, complement was taken up, and hyperemia, cell infiltration and softening of the focus resulted; and that as a result of this union the general reaction and local changes of the part occurred. They believed that where antibodies existed in the blood the injected tuberculin was neutralized and no reaction followed.

This theory of Wassermann and Bruck's as to the general and local reaction in the tuberculin inoculation did not seem to be fully sustained by the experimental evidence advanced by them, and was soon attacked by Weil and Nakayama.[7] The latter authors maintained that it was inconsistent that tuberculin antibodies and tuberculin should exist separately in a tuberculous focus at the same time with the former in such quantities as to attract circulating tuberculin. This contention alone, however, could not have great weight, because, as Wassermann pointed out, it is possible to find antigen and corresponding antibodies in the blood at the same time. Weil and Nakayama investigated the tuberculous organ extract as to antituberculin, and stated that they believed the complement-binding observed under these circumstances was due to a summation of less than inhibiting quantities each of tuberculin and tuberculous organ extract.

A substantiation of this latter point, which could but greatly compromise the value of the experimental proof deduced by Wassermann and Bruck in support of their theory, was soon forthcoming in the publication of Morgenroth and Rabinowitsch.[8] They reported that they were unable to find antituberculin in the blood of cases of tuberculosis treated with tuberculin; they were unable to note any difference between normal and tuberculous organ extracts as to their anticomplement action. They referred to the inhibiting action of Koch's old tuberculin alone. They agreed with Weil and Nakayama[7] as to the summation of a non-specific inhibition of hemolysis by organ extract and tuberculin. In view of their negative experimental findings, and from an elaborate argument, based on theoretical grounds, they believed the theory of Wassermann and Bruck as to the action of tuberculin to be unfounded.

Lüdke,[9] on the other hand, reported finding antituberculin in tuberculous organ extract, also in the serums of seventeen out of thirty-one cases of tuberculosis treated by tuberculin. He noted that those who had antibodies in their blood showed no or very slight reaction to tuberculin injections, while those who failed to show antibodies gave a marked reaction. He examined eight tuberculous patients before and after tuberculin treatment, and was able to demonstrate antibodies in seven of them, only after tuberculin treatment had been used. He noted, also, that he found antituberculin in few patients who had not had specific treatment. The results of his experiments were practically the same as those of Wassermann's and Bruck's.

Citron[10] examined a number of cases treated with tuberculin. In 6 of these, antibodies were not found and 5 of them reacted to tuberculin; of 8 cases, with the blood of which he obtained the complement-binding reaction, 6 failed to react to tuberculin. He and Wassermann had also observed antibodies in a case that had not received tuberculin treatment. Confirming Wassermann and Bruck's investigations, he concludes that antituberculin is, as a rule, not demonstrable in the

* Read in the Section on Diseases of Children of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.

1. Courmont: Lancet, London, 1908, ii, 1740.
2. Koch: Deutsch. med. Wchnschr., 1901, xxvii, 829.
3. Arloing: Compt. rend. Acad. d. sc., 1898, cxxvi, 1398.
4. Jürgens: Ztschr. f. exper. Path. u. Therap., 1905, i, 569-602.
5. Bordet and Gengou: Compt. rend. Acad. d. sc., 1903, cxxxvi, 351.
6. Wassermann and Bruck: München. med. Wchnschr., 1906, liii, 2396.
7. Weil and Nakayama: München. med. Wchnschr., 1906, liii, 1001.
8. Morgenroth and Rabinowitsch: Deutsch. med. Wchnschr., 1907, xxxiii, 705.
9. Lüdke: München med. Wchnschr., 1908, lv, 783, 856.
10. Citron: Deutsch. med. Wchnschr., 1907, xxxiii, 1165.

serum of tuberculous patients, but that occasionally, owing to unknown causes, it may be found; that those patients who are treated systematically with tuberculin and who lose in the course of their treatment their original reaction for tuberculin, regularly show antibodies in their blood, on account of which he attributes the absence of reaction to tuberculin injections; that antibodies almost always fail in the serums of those tuberculous patients who still react to tuberculin; that in the latter cases the tuberculin that enters the circulation is abstracted from it by the antibodies present in the diseased focus, on account of which the local and general reaction result.

Christian and Rosenblat[11] have studied this question in animals. They observed that the serums of animals that had been immunized with tuberculin or infected with tuberculosis agglutinated tubercle bacilli. Under these conditions, however, they failed to find antituberculin. If the tuberculous guinea-pigs were injected with tuberculin, antibodies appeared in their blood; such guinea-pigs were found to be less resistant than those that had not been treated. If tuberculin injections were begun on the second day after infection, the pigs lived a couple of months longer than the control animals. They refer this lowered resistance in late employment of tuberculin injections to a negative phase and suggest that where it is possible, as it is in man, to bring them through to a positive phase, healing of the tuberculosis might result. They believe with Wassermann that the antituberculin bodies are produced in tuberculous tissue. In support of this they cite experiments in which many of the tuberculous glands of infected guinea-pigs were removed and thereafter a disappearance of antituberculin from the blood was observed.

Engel and Bauer[12] were unable to demonstrate complement-binding antibodies in the blood of tuberculous children before inoculations with tuberculin. With tuberculin treatment the antibodies were found quite uniformly increasing with the immunity of the child against larger doses of tuberculin.

Weil and Strauss[13] examined by the complement-deviation reaction the bloods of thirty-three patients with pulmonary tuberculosis who had been treated with tuberculin for several months. They concluded that the presence of antibodies in the blood did not go hand in hand with the disappearance of the tuberculin reaction, but, on the contrary, were most frequently found in those who reacted strongly to tuberculin injections. At the same time they did not believe that the hypersensitiveness to tuberculin was attributable to those antibodies. They believe that antibodies are present in tuberculosis because of the existence of a hypersensitiveness, anaphylaxis, and not because the latter is due to antibodies. They consider that the action of tuberculin, instead of being cleared up by the theory of Wassermann or by the bacteriolytic theory of Wolff-Eisner,[14] remains an unexplained phenomenon.

The hypersensitiveness to tuberculin, as exhibited by the skin reaction of Pirquet, was investigated by Czastka with relation to the complement-binding antibody content of the blood. Twenty tuberculous patients were examined, fourteen of whom had not been treated with tuberculin. In four of the latter antituberculin was found, three of these giving the tuberculin skin reaction. Seven of the remaining fourteen cases gave a positive Pirquet reaction. Of the seven patients treated with tuberculin, three showed antibodies in the blood. Two of these gave a positive Pirquet reaction on first vaccination, the third patient reacting slightly after the second vaccination. Of the other four cases not showing antibodies, three gave a positive result.

Czastka[15] concluded that complement-binding antibodies did not bear any relation to tuberculin treatment, or to the Pirquet reaction; that in view of the uncertainty that bacteriolysins exist against tubercle bacilli, and especially against heated bacterial fragments, the bacteriolytic theory of Wolff-Eisner was unfounded. Wolff-Eisner and Ascher observed that the majority of the tuberculous patients they examined showed complement deviation, and that it was impossible to trace any close relation between this and the results of the skin and conjunctival reactions. They questioned the specificity of the complement-binding reaction in tuberculosis, having found it in other infections.

Cohn[16] noted an absence of antibodies in the early stage of tuberculosis in 14 cases, but obtained a complement deviation reaction in 15 of 53 cases in the second and third stages of tuberculosis which had not been treated with tuberculin. He was unable to demonstrate tuberculin in the blood of patients with miliary tuberculosis, as reported by Lüdke and Bruck. He did not observe any relation to exist between the presence or absence of antibodies in the blood and the reaction of the patient either to tuberculin treatment or to general or local reactions from tuberculin.

In view of the evident uncertainties and the failure of agreement in the results presented by various observers concerning the complement-binding antibody and its relation to tuberculin reactions and tuberculin therapy, and recognizing the importance of the establishment of such a relationship, if possible, we examined a number of cases of tuberculosis with a view to investigating the complement-binding antibody content of the blood of patients who had not and of those who had received tuberculin inoculations and also to see if these antibodies bore any relation to the results of the tuberculin skin reaction. We have also ascertained the opsonic content of the blood in some of these cases with a view to determining its relation to the complement-deviation antibody and likewise its relation to the skin reaction.

The bacteriolytic theory of Wolff-Eisner concerning the skin and conjunctival reactions appears to be unsupported by any experimental evidence. Zieler[17] has recently shown that old tuberculin which has been completely freed from all tubercle bacilli fragments, provided any had existed in it, gives a stronger reaction, if any difference can be noted, than the old tuberculin not so treated. Also these reactions were obtained from material separated by dialysis from tubercle bacilli emulsion. Zieler found that the histologic changes of the skin in the Pirquet reaction were practically the same as those that follow infection with tubercle bacilli.

The technic employed in applying the complement-deviation reaction for antibodies in tuberculosis is the same as that used in demonstrating the complement-binding substances in syphilis, except that in tuberculosis old tuberculin, an emulsion of tubercle bacilli, or an extract of a tuberculous organ is used as antigen. Koch's old tuberculin is the most frequently used and apparently is the most satisfactory. The inhibiting

11. Christian and Rosenblat: München. med. Wchnschr., 1908, lv, 2032.
12. Engel and Bauer: München. med. Wchnschr., 1908, lv, 2273.
13. Weil and Strauss: Wien. klin. Wchnschr., 1908, xxi, 1058.
14. Wolff-Eisner and Ascher: Wien. klin. Wchnschr., 1908, xxi, 1299.
15. Czastka: Wien. klin. Wchnschr., 1908, xxi, 877.
16. Cohn: Berl. klin. Wchnschr., 1908, xlv, 1309.
17. Zieler: München. med. Wchnschr., 1908, lv, 1685.

properties of old tuberculin alone are very pronounced. On this point Morgenroth and Rabinowitsch lay much stress. We found, also, that sometimes small quantities of tuberculin would inhibit hemolysis. Cohn also has observed that smaller quantities sometimes inhibited more than larger in the test and mentions this as an argument against the contention of Weil and Nakayama that a positive specific complement-deviation reaction may occur through a summation of two non-specific inhibiting substances. The old tuberculin[18] employed by us in our examinations had to be used in smaller quantities than those reported by many authors. We found that 0.2 c.c. and sometimes 0.1 c.c. of old tuberculin strongly inhibted hemolysis, necessitating reduction of the amounts to 0.05, 0.025 and 0.0125 c.c.

Tuberculous serums, as well as the serums of many normal and diseased individuals, sometimes inhibit hemolysis alone, which likewise often requires the amount of serum used to be reduced; on the other hand, occasionally a larger quantity of serum may not exert this inhibiting action because of its possessing amboceptor for sheep's corpuscles.

The protocol of an examination of a tuberculous serum giving a positive reaction would read as follows:

Antigen.	Serum.	Guinea-Pig Serum.	Rabbit Serum.	Sheep Corpuscles Emulsion, 5 Per Cent.	Result Hemolysis.
0.05	0.1	0.1	0.002	1	No
0.05	0.2	0.1	0.002	1	No
0.025	0.1	0.1	0.002	1	No
0.025	0.2	0.1	0.002	1	No
0.05	...	0.1	0.002	1	Yes
0.025	...	0.1	0.002	1	Yes
.....	0.4	0.1	0.002	1	Yes

In each test, control serums of normal individuals are included and put through the same series of examinations as the tuberculous serums. We have not infrequently seen a considerable binding of complement with a serum from an apparent normal.

The cases herewith reported were cases of pulmonary tuberculosis in the second and third stages.

TABLE OF COMPLEMENT-DEVIATION REACTIONS IN TUBERCULOSIS

Case. No.	Complement Deviation Test.	Opsonic Index.	Pirquet Reaction.	Treatment Tuberculin. T. R.
38	+	1.32	+	Yes
39	..	0.56	+	Yes
40	..	0.17	+	Yes
42	..	0.73	..	Yes
43	+	0.51	+	Yes
44	+	0.76	+	Yes
51	+	0.8	..	Yes
45	..	0.99	..	No
46	+	0.76	..	No
47	+	0.88	..	No
71	+	0.98	+	No
72	..	0.69	+	No
73	..	0.3	+	No

Of five cases of tuberculous joint and bone disease, two gave a positive complement-deviation reaction. None of the patients received tuberculin. The patients who were being treated with tuberculin were examined on the day they received their injections. As they were receiving injections twice a week the blood examinations would come on a day that would correspond to a high tide of immunity in the opsonic sense. This point is of importance, as we have learned from a study of opsonins that in the interim of inoculations a negative and positive phase, with regard to index can usually be made out, and various antibodies usually increase at the same time. All but five of the patients examined by us had pulmonary tuberculosis. It is not always possible in such cases to secure from inoculations the negative and positive undulations, because of the factor of auto-inoculations. In the few cases in which we made a single record it will be observed that in only one was the index found above normal. In regard to the complement-binding antibodies of the blood of patients treated with tuberculin and those not so treated, we found that 4 out of 7 who were treated with tuberculin and 3 out of 6 who were not receiving tuberculin gave the reaction. Of the tuberculin-treated cases, three of four that gave the complement-deviation test gave a positive Pirquet reaction, and in one of the latter the opsonic index was above normal. Of the untreated cases, one of the three that had complement-binding antibodies gave a positive skin reaction. Of three of the untreated cases that did not show antibodies, two gave a positive skin test.

18. The old tuberculin was received from the experimental department of Parke, Davis and Company.

CONCLUSIONS

As a result of our work, we believe the following conclusions justified:

No relation exists (first) between the complement-binding antibody and tuberculin inoculations and vaccinations; (second) between the complement-binding antibody and the opsonic index; or (third) between the opsonic index and the tuberculin skin reaction.

Not only have our examinations failed to show any relation between tuberculin antibodies and tuberculin reactions and inoculations, but, on account of observing occasionally an inhibition of hemolysis with normal serums, we are strongly inclined to believe that the complement-binding reaction is not specific for tuberculosis.

72 Madison Street—882 West Madison Street.

OLIVE-OIL FOR POSTANESTHETIC NAUSEA *

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It has been shown in work soon to be published that fats and other ether-soluble substances, when introduced into the alimentary tract of individuals subjected to ether anesthesia, are capable of restoring to the blood certain properties which are inhibited by the action of the drug, viz.: those concerned with the phenomena of phagocytosis. With the idea in mind that other effects of ether, such as nausea and vomiting—whether these be due to a local irritating action of the drug on the gastric mucosa or to a more general action elsewhere—might also be influenced by the introduction of a fat, such as olive-oil, into the stomach, in a series of cases, patients were given olive-oil by mouth immediately after partial restoration of consciousness following an ether anesthesia. Up to this time thirty patients in all have been treated in this manner. The results have been striking. In certain of the cases nausea failed to occur at any time. In a second group in which nausea had begun prior to the administration of the oil it was immediately checked by this treatment. In only one of the thirty cases was nausea observed after giving the oil. In this case consciousness had been regained, and nausea and vomiting had set in. One ounce (30 c.c.) of olive-oil was then given by mouth. Almost immediately the patient remarked on the "soothing" sensation produced by the oil. Nausea and vomiting ceased and remained absent for ten hours, at the end of which time there was a return of the symptoms in a mild form. The cases chosen were all simple, so-called "clean," surgical cases in which the probability was strong that such nausea as

* A Preliminary Report from the Department of Surgery, Rush Medical College.

might occur would be due entirely to the anesthesia and not to any other cause, such as bacterial intoxication, extensive injury to the peritoneum, etc. The duration of anesthesia varied from half an hour to an hour and a half. The open drop method was employed in all cases.

It should be emphasized that it has been found necessary to use an olive oil of high grade of purity. Oil that has become rancid through exposure to air or that contains a considerable amount of free fatty acids liberated by a process of sterilization should not be employed. Squibb's olive oil has been used in these experiments.

Whether or not ether anesthesia causes nausea and vomiting by a local action of swallowed or excreted ether on the gastric mucosa or, as is more generally accepted, through its action primarily on the central nervous system, cannot be discussed at length in this report. Nevertheless, it is interesting to note in this connection that in those cases in which nausea and vomiting had already set in relief was experienced immediately after swallowing the oil, a fact which supports the idea of a local irritation. In the single case in which nausea recurred it was at a time when all the oil should have passed from the stomach into the bowel.

Up to this time no observations have been made on nausea and vomiting following anesthesia with chloroform or other anesthetics.

1801 Monroe Street.

THE NATURE OF THE VIRUS OF EPIDEMIC POLIOMYELITIS *

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In our previous articles[1] on the transmission of epidemic poliomyelitis to monkeys, we have left undiscussed the nature of the virus responsible for producing the disease. From the beginning, our attention has been directed toward the solution of that fundamental question, but the results of our studies were, until recently, wholly of a negative nature. We failed utterly to discover bacteria, either in film preparations or in cultures, that could account for the disease; and, since among our long series of propagations of the virus in monkeys not one animal showed, in the lesions, the cocci described by some previous investigators and we had failed to obtain any such bacteria from the human material studied by us, we felt that they could be excluded from consideration.

We have, up to this time, made a very painstaking study of film preparations and sections prepared from two specimens of human spinal cord and many specimens of the spinal cord and brain (and other viscera) obtained from monkeys, prepared and stained in the most various ways, but without finding either bacterial or protozoal parasites that could account for the infection.

The readiness with which epidemic poliomyelitis can be transmitted to monkeys and the failure to find visible and stainable parasites in the lesions of the spontaneous and experimental disease led to another line of investigation. It is known, for example, that the viruses of vaccinia and rabies, neither of which has been certainly demonstrated in films or sections of tissues or cultivated artificially, withstand very well the action of glycerin, while bacteria withstand it far less well. The bacteria mechanically admixed with the virus of vaccinia can be destroyed by glycerination.

We have, therefore, suspended in glycerin the comminuted spinal cords of monkeys affected with poliomyelitis, and, after an interval of days, we have inoculated the glycerinated virus into normal monkeys. In the experiment to be reported, the cord of Moneky 40, of the second generation of virus K, was kept in glycerin for seven days, after which, the glycerin having been washed away with salt solution, and the suspended tissue recovered by centrifugalization, it was inoculated intracerebrally into Monkey 35. This latter animal developed paralysis on the tenth day after inoculation and showed the characteristic lesions of epidemic poliomyelitis in the spinal cord and brain.

In order to determine whether this effect was produced by the living virus or by an adherent toxic body, the cord of Monkey 35 was injected into Monkey 58, which developed paralysis eleven days after the inoculation. The lesions in the latter monkey were also characteristic.

The next series of experiments was planned to determine the probable size of the organism producing epidemic poliomyelitis, so far as this could be accomplished by the use of mechanical filters. The experiment to be related briefly was made with the cord of Monkey 56, which succumbed to the fifth generation of virus K. The cord was triturated with sterile quartz sand, mixed with salt solution, thoroughly shaken and pressed through a Berkefeld filter. The clear and sterile filtrate was injected intracerebrally into Monkey 68, which developed paralysis on the seventh day following the inoculation.

From the foregoing experiments, taken in conjunction with the negative results of bacteriologic and histologic examinations, it would appear that the infecting agent of epidemic poliomyelitis belongs to the class of the minute and filterable viruses that have not thus far been demonstrated with certainty under the microscope.

Since the publication of our last note, the fact has been determined that the virus of poliomyelitis can be transferred to the central nervous system by way of the subcutaneous tissues in monkeys. The two viruses have now each been passed through six series of animals.

105 East Sixty-second Street.

REPORT OF CASE OF PRIMARY TUBERCULOUS INFECTION THROUGH INTESTINE WITHOUT INTESTINAL LESION

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The almost innumerable observations and researches on the various phases of tuberculosis, more particularly in recent years, have gradually but surely led to the conclusion that not only is infection primarily contracted through the alimentary system far more frequently than was previously supposed; but a number of competent observers have expressed a positive opinion that the danger from ingestion of the bacilli is even greater than by inhalation, and that many apparently primary tuberculous processes in the lungs or elsewhere in the body are in a large percentage of instances in reality but the manifestation of an infection occurring through the intestinal tract.

* From the Laboratories of the Rockefeller Institute for Medical Research, New York.

1. The Transmission of Acute Poliomyelitis to Monkeys, THE JOURNAL A. M. A., Nov. 13, 1909, liii, 1639; Dec. 4, 1909, liii, 1913.

Clinically such conclusions are based largely on the frequent occurrence of intestinal lesions in artificially fed infants, but the direct proof of this route of infection naturally rests on animal experiments.

Chauveau,[1] who was the first to demonstrate the infectivity of the human bacillus for cattle clearly proved this method of infection, as did later Nocard,[2] Tjaden[3] and Cipollina,[4] by using kittens, young pigs and monkeys as well as cattle in their feeding experiments.

The still further disputed question of whether a lesion of the intestinal mucosa is necessary for infection by this channel has also been approached in a similar manner. Dorbroklonski[5] introduced cultures of tubercle bacilli into the stomach of normal guinea-pigs, and from a most careful microscopic as well as macroscopic examination of the entire digestive tract concluded that living bacilli were capable of passing through the perfectly normal intestinal mucosa of guinea-pigs and that no lesion of any description was necessary. Similarly Ravenel[6] was able to recover virulent bacilli from the chyle of previously healthy dogs fed with cultures mixed with melted butter as early as three and one-half to four hours after feeding.

From these and various similar experiments it would appear undoubtedly that not only is the intestine frequently the portal of entrance for the bacilli, but that in the lower animals, at least, infection may occur through a perfectly normal intestinal mucous membrane.

In man, however, this is particularly difficult to demonstrate because at autopsy there is most frequently present either, on the one hand, an advanced stage of the disease with multiplicity of lesions which makes it impossible to detect with certainty the primary source of infection or, on the other hand, a rapidly fatal process confined to the lungs alone.

The findings in the present case noted in a routine post-mortem examination under circumstances which rendered a particularly careful examination of the parts affected necessary are of interest from the fact that, while the conditions noted arose in a wholly natural manner, they resemble those produced in the experiments quoted and bear closely on the results.

Subject of Examination.—This was a colored man, aged 32, a patient of the State Hospital at Trenton for three years previous to his death. He was a general paretic, dull, stupid and much deteriorated, and untidy and filthy in his habits. He was placed in a ward occupied by other negroes, many of whom were similar in general behavior. His mental condition and habits offered excellent opportunity for infection by the intestinal tract. His last illness was cardiac weakness from chronic myocarditis. There was no loss of weight or other suggestion of any constitutional disorder.

Autopsy.—Examination of the thorax showed the pericardium and pleuræ to be normal. The heart muscle was the seat of atrophic and interstitial changes. The lungs were both considerably engorged and the dependent parts showed some partial lobular consolidation. No nodules, pleural scars or thickenings were present. There was no macroscopic indications of tuberculosis and the peribronchial glands were not unusual. The general abdominal cavity was likewise negative. Both the parietal and visceral peritoneum was free from adhesions or exudate. The liver and kidneys were affected with early interstitial changes.

The pancreas, adrenals, bladder and prostate showed nothing abnormal.

For the reason that, at the time the autopsy was made, an outbreak of typhoid fever was feared in the institution, an unsuspected case having been discovered at autopsy shortly before, special attention was given to the intestinal tract, spleen and mesenteric lymph-glands. The latter in the region of the lower three feet of the ileum were greatly enlarged, about six or eight of the glands being as large as walnuts; others were about the size of a pea, and a few similarly enlarged glands were found at the root of the mesentery.

Typhoid was immediately suspected, although the spleen was quite small and firm, and the intestine was most closely examined, both externally and internally, for any variety of lesions.

Practically nothing was found. The mucosa of the duodenum, jejunum and large intestine showed indefinite areas of blood stasis only.

The mucosa of the ileum was smooth and pale throughout; there was not the slightest indications of injection, erosion, ulceration or enlargement of Peyer's patches or solitary follicles. The serous coat everywhere appeared normal.

A careful examination of a smear preparation from an enlarged mesenteric gland showed tubercle bacilli in limited numbers and a large part of the ileum opposite the affected lymphatics was saved for microscopic examination. The other organs, including the brain, heart, lungs, kidneys, pancreas, adrenals, and lymph-nodes, were examined microscopically.

Cultures on agar were taken from the liver, spleen, bile and mesenteric glands; colon bacilli only were found.

Microscopic examination of the pancreas, adrenals, liver and kidneys showed no lesion of importance in connection with the special findings. There was a moderate grade of chronic interstitial overgrowth in liver and kidneys, but no indication of tubercle formation.

Sections from all of the more suspicious looking areas of the lungs showed merely an engorgement and edema with a moderate cellular alveolar exudate; an early simple broncho-pneumonia incidental to the cardiac condition without any special characteristics.

A satisfactory examination of the intestine was possible, the autopsy being performed only two and one-half hours after death. Extended examination of sections from the ileum at different levels along the lower third, including the entire circumference, showed the mucous membrane to be the seat of early post-mortem alteration, but entirely free from erosion or ulceration. No indication of infiltration or hyperplasia was found in the submucous lymphoid tissue or follicles. The intestinal findings were pronounced negative only after prolonged search.

Two organs contained tuberculous lesions, the spleen and mesenteric glands. In the latter the process was fairly well advanced, the largest glands showing massive central coagulation necrosis with very little unaffected tissue remaining; the smaller glands showed numerous giant cells and scattered solitary tubercles in which tubercle bacilli were demonstrable after alcohol fixation.

The spleen, though macroscopically negative, showed a condition somewhat similar to that in the more slightly affected lymph-nodes, though even less advanced.

Scattered through the pulp were fairly numerous incipient tuberculous foci, represented by small collections of epithelioid cells, with an occasional giant cell or minute area of necrosis. The number of lesions was considerably greater proportionately than the apparent age of even the more advanced individual tubercles. The lesions in the spleen suggested a very recent but rather severe infection. As before indicated, no lesions in any way suspicious of tuberculosis were found elsewhere.

Notwithstanding the fact that no lesions, tuberculous or otherwise, were found in the intestine, the case is regarded as one of primary infection through this organ.

It is realized that tuberculosis of the mesenteric glands *per se* is not necessarily an indication that the channel of infection was the intestine, and that these are not only frequently but commonly infected in processes of a general nature.

1. Chauveau: Compt. rend. et mém. du Cong. p. l'étude de la tubere. chez l'homme et chez les animaux, Paris, 1891, p. 51.
2. Nocard: Schweiz. Arch. f. Thierh., September, 1902.
3. Tjaden: Centralbl. f. Bakteriol., February, 1903.
4. Cipollina: Berl. klin. Wchnschr., Feb. 23, 1903.
5. Dobroklonski: Arch. de méd. expér. et d'anat. path., Paris, 1893, Series 7, ii, 253.
6. Ravenel: Pub. Health Reports and Papers, Am. Pub. Health Assn, Columbus, 1904, xxix, 404.

On the other hand, it is certainly a recognized characteristic of tuberculous infection generally that involvement of the regional lymphatics is the best guide to the original point of infection; and this applies more particularly to cases such as the present, in which the infection is recent and the areas limited.

This view is based not merely on human autopsy findings, which in themselves are sufficiently numerous to support the view, but on exact experimental methods as well.

Among the investigations in human subjects may be mentioned the work of Heller,[7] who, in order to approach the question of primary intestinal tuberculosis, examined the bodies of 714 persons dead of diphtheria, and based his opinion that about 31 per cent. of the tuberculosis found was primarily intestinal on the tuberculous condition of the mesenteric glands.

On the experimental side, among others, are the works of Tjaden[8] and Schottelius,[9] who in all their animals fed with tuberculous material found a marked tuberculous mesenteric adenitis as well as larger lesions of the lungs, pleura and other viscera.

Schroeder and Cotton[10] considered that the mesenteric tuberculosis found in a calf subcutaneously inoculated with tubercle bacilli (a severe tuberculous bacteriemia) was due either to direct transmission of infection from the seat of inoculation or from bacilli coughed up from the lung and swallowed. In this animal the lungs were heavily infected.

If in the examples quoted the conclusions relative to intestinal and mesenteric lymph-gland infections can be accepted, certainly in the present case, in which no tuberculous foci, however small, were found either in lungs, bronchial glands or other organs which might create doubt, the assertion that the infection entered through the unaltered intestinal mucosa and first manifested itself in the regional lymphatics may be accepted, the only alternative being that the case was of the type of *typho-bacillose* of Landouzy,[11] which from both the clinical history and post-mortem findings seems extremely unlikely.

Two points are worthy of emphasis:

1. An unquestionable instance of primary tuberculous infection through the intestine in an adult individual, as shown by the marked foci in the regional lymphatics.

2. The passage of active tubercle bacilli through an intestinal mucosa which to both macroscopic and microscopic examination showed no trace of a demonstrable lesion.

The presence of multiple additional foci in the spleen indicates the manner in which the infection was progressing; had the disease been allowed to continue its course it would have doubtless terminated in a diffuse miliary tuberculosis without definite suggestion of the primary source of infection. But, as previously stated, the purely accidental discovery of the condition at the exact stage when of sufficient duration to make perfectly clear the process without obscuring the true significance gives to the case the definiteness of experimental observations along similar lines, and offers a demonstrable proof and natural illustration of what must be of frequent occurrence, though seldom capable of so direct demonstration, in man.

New Jersey State Hospital.

7. Heller: München. med. Wchnschr., April 15, 1902.
8. Tjaden: Deutsch. Vrtljschr. f. öff. Gsndhtspflg., xxxiv, No. 3.
9. Schottelius: München. med. Wchnschr., Sept. 30, 1902.
10. Schroeder and Cotton: Bull. 93, Bureau of Animal Industry.
11. Landouzy: International Congress of Tuberculosis, Washington, D. C., 1908; abstr. in THE JOURNAL A. M. A., Oct. 17, 1908, li, 1359.

RECENT FINDINGS REGARDING THE DISTURBING ELEMENTS IN MILK FOR INFANTS *

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The editions for 1909 of Holt's "Pediatrics" in this country and of Still's "Diseases of Children" in England, together with the current literature, give no evidence, so far as I can find, of any change in the commonly accepted opinion that it is the excess and the inadaptability of the casein in cow's milk and the low percentage of fat that cause the chief inherent difficulties in the administration of milk. Likewise there is no change from the belief that the sugar of cow's milk creates no disturbance, especially if the percentage be increased by the addition of cane-sugar or milk-sugar to a point approximating the amount contained in human milk. Koplik refers to the fact that the salts of cow's milk, chiefly lime and potassium, are not well assimilated, fully 34 per cent. being excreted.

So the recent studies in Germany must be regarded as revolutionary, and perhaps evolutionary, since they regard the casein of cow's milk as perfectly harmless and place the responsibility for the digestive difficulties on the salts, sugar and in some conditions the fat (the latter being the chief cause in the exudative diathesis and those diseases described as "dyspepsie" and "decomposition.") During the last few years Professor Finkelstein and his colleagues, Myer and Rosenstern, have been carrying on investigations at the Berlin Kinderasyl, probably the largest hospital for infants in the world, studying the metabolism and pathology of infant-feeding. Their findings are, in the main, accepted by most of the pediatrists of Germany, and have been confirmed by some of the other investigators. It is to the kindness of those in charge at the Kinderasyl that I am indebted for the privilege of seeing the work being done on this subject.

REGARDING THE SALTS OF COW'S MILK

The salts of cow's milk which are of importance are sodium, calcium, potassium and magnesium chlorids, and they are three and one-half times as abundant as in human milk. In contradistinction to the salts in human milk, they frequently act as a direct poison to the child, even when reduced to the same or lower percentage found in breast-milk. Sodium chlorid in physiologic solution has been proved by Finkelstein to be a poison to sucklings when given internally. Intravenous injection of the same causes fever, acting, it is supposed, directly on the heat centers. The salts of cow's milk have been proved experimentally to react badly on the baby on account of the antagonism between the sodium and the calcium. The salts of the milk most easily taken care of by the infant are the calcium chlorid and magnesium chlorid in combination. The potassium chlorid and the sodium chlorid are antagonistic. Infants of suckling age react more to salts than older children. If sodium chlorid is given a clinical reaction occurs, marked by a slight rise in weight, while with the calcium chlorid a decrease in weight occurs. If 100 grams sodium chlorid solution is given internally the temperature goes up to 104 F. in from four to six hours. The calcium salts alone give a subnormal temperature, but when combined with sodium chlorid a rise of temperature results, and is thought to be from an antagonistic combination of the sodium and calcium which is unfitted to the child's

* Read before the Jackson County Medical Society, Oct. 19, 1909.

digestion and acts as a poison. Sixty per cent. of the bottle-fed infants in Germany have a tendency to convulsions, a condition called spasmophilia. This is manifested by an oversensitiveness in the electrical reactions, an overexcitability to the open cathode pole. When the infant reacts to less than five milliampères, the pathologic condition of spasmophilia exists. Experiments with the various elements of cow's milk have been made. When casein or fat or sugar alone are given, no electrical overexcitability appears, but when the salts of the milk are fed the infant reacts to less than five milliampères. Other manifestations of spasmophilia appear in the salt-susceptible infant, such as the facial phenomenon (Chvostek's) and Trousseau's symptom of spastic contraction of the hand, all of which disappear when the food is salt-free.

SUGAR DISTURBANCE

A distinct clinical type of infantile disturbance has been investigated and described by Finkelstein[1] under the name of sugar intoxication. The condition is not an intestinal infection, but depends on the presence in the food of the sugar of cow's milk and its intolerance by certain infants. The elimination of the sugar causes the disappearance of the symptoms and a return to health. The sicker the child the less sugar required, it has been shown experimentally, to cause the acute condition. Infants suffering from the various stages of intestinal and nutritional disturbances leading up to marasmus are more susceptible to sugar intoxication, and they react with an elevation of temperature when sugar alone or milk containing sugar is given. The other symptoms are made constantly worse, and we find the infant presenting the following:

1. A general appearance of collapse.
2. A sort of coma, lasting a minute, resembling in some ways a meningitis. The child pays no attention to surroundings and sleeps all of the time, appearing benumbed.
3. A sudden drop in the weight.
4. Fever. This is always present, irregular, but comes up suddenly as high as 104 to 105.8 F.
5. A leucocytosis of from 25,000 to 60,000.
6. Sugar always present in the urine. It is an alimentary glycosuria, due to inability of the blood to oxidize the sugar.
7. Changes in the character of respiration. It becomes coma-like, irregular, but with a characteristic lengthening.
8. Diarrhea with green fermented stools, as many as eight daily.
9. Albumin in urine. There is no acidosis or butyric acid, as is found in diabetes. The sugar acts in these cases as a direct intestinal poison and as the cause of the series of symptoms.

The administration of weak tea and water and the withdrawal of all sugar will cause a prompt disappearance in twenty-four hours of all the symptoms in the milder cases, the severer cases requiring longer; then small feedings of breast-milk should be given for fourteen days, or, if the child is bottle-fed, no sugar should be given until the end of that period. Malt-sugar is found to be better tolerated in these cases than cane-sugar. Milk-sugar is the least tolerated, and in general has the least influence on body growth.

1. Monographs by Finkelstein and his assistants may be found in the Berlin Jahrbuch für Kinderheilkunde during the past two years

SUMMARY

The following points are proved:

1. The salts of cow's milk have a pathologic influence on the infant, causing a condition of spasmophilia or tendency to convulsions, which may go to a spasm of the glottis, tetany or an eclampsia. The treatment consists simply in feeding for a period with a salt-free diet.

2. The sugar of cow's milk is not tolerated by some infants, acting as a poison and causing a distinct symptomatology, a condition called sugar intoxication, which disappears promptly on the elimination of sugar from the food. It is also associated at times with those disturbances, the most extreme of which is marasmus, in which the infant has an intolerance for fat. The hunger-cure is practiced in these conditions, either the sugar or the fat or both being eliminated from the milk until the symptoms have improved.

532 Altman Building.

SODIUM NITRITE IN BRONCHIAL ASTHMA

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Few pictures of human suffering have so stirred up the pity and despair of the physician and demonstrated a single shortcoming of therapeutics as have obstinate attacks of bronchial asthma. What a boon to both patient and doctor would be a drug to relieve the spasm of the bronchial muscles! The narcotic agents used for this purpose—morphin and chloral—are not suitable for frequent use and are not always reliable. Potassium iodid is not often efficient. The ordinary antispasmodics are impotent. Inhalation of the smoke of potassium nitrate, stramonium, etc., often fail to bring relief and are detrimental because they irritate the bronchial mucous membrane. Amyl nitrite and nitroglycerin often give some relief, but their effect is fugacious.

I recently attended a patient who had been afflicted with asthma for forty-six years. His last attack was complicated with a coryza and trachitis and a very severe laryngitis. I treated the combined conditions for about ten days with various drugs and produced some improvement in the inflammations, but scarcely any improvement in the breathing. It then occurred to me to try sodium nitrite. I administered one grain of it by mouth, and in about half an hour the dyspnea diminished and the radial artery, which had been contracted, became somewhat relaxed. Two hours after the first dose the patient received another grain, and in about half an hour he was breathing naturally and the pulse was soft. Thereafter the patient took one grain of the sodium nitrite about every two and one-half or three hours for two days, and then the intervals were gradually increased until, after about a week, he limited the use of the medicine to one dose at bedtime, and thus continued it for several days. As soon as the sodium nitrite relieved the spasm I began to treat the patient's nervous system. The asthma did not recur, but the laryngitis long persisted.

Another recent case of bronchial asthma occurred in a man 64 years of age who had had the disease since youth. When called, I found the patient sitting bent far forward, his elbows resting on his knees. Every act of respiration was performed with the greatest muscular effort and by a slight rhythmical raising and lowering of the body. The patient's face expressed help-

lessness and weariness from effort, lack of sleep and the impossibility of eating. His pulse was tense. He had been taking medicines without the slightest benefit. I gave him one grain of sodium nitrite and after about half an hour there was slight improvement. One hour after the first dose I gave a second one, and about half an hour after it the patient was very much relieved. He continued to wheeze slightly, but he could breathe with considerable ease and could rest against the back of his chair. He began to yawn and soon fell asleep. He continued for a few days to take one grain of the drug every two or two and one-half hours and enjoyed comfort about the house and on the street. I saw him a week after my first call and he told me that he was taking occasional doses of the drug. He then passed from my observation. I gave him also constitutional treatment, for asthma is primarily a nervous affection which may be started by numerous stimuli of discomfort.

In the severe cases of asthma the initial dose of sodium nitrite should probably be two grains by mouth. The drug may be given hypodermically when dyspnea is severe. It is a remedy of marked action on unstriped muscle and should be given with discretion. The limit of dosage is indicated usually by a feeling of distention of the head and then headache.

RECURRENT VOMITING WITH ACETONURIA

REPORT OF TWO CASES

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The occurrence of two cases of recurrent vomiting in members of the same family, a brother and sister, is my apology for offering the following report:

CASE 1.—The elder of the patients is a boy of 7, rather small, as his parents are, but active and vigorous, though of a distinctly neurotic disposition. He was delivered at term by instruments, and nursed for six weeks with poor success. From that time on he passed through the hands of various physicians, who tried in vain to find a suitable milk modification. During this time he was constantly subject to vomiting, colic and indigestion. Measles and whooping-cough have been his only other sicknesses. The mother, who is a keen observer, thinks that the child has always had this type of vomiting, because of its severity and associated prostration. It was not until the boy was in his fifth year, however, that acetone and diacetic acid were first demonstrated in the urine, and a correct diagnosis established. Since this time the patient has been seen in some ten attacks, though he has had many others, and at these times acetone has always been detected on the breath and in the urine. Recurrence has taken place in from five weeks to five months, and attacks have usually lasted four or five days, being attended by almost constant vomiting, marked emaciation, and prostration. During the last nine months he has had only three attacks, but one in the summer, of marked severity, was accompanied by considerable hematemesis. As the child grows older, attacks are becoming less frequent and according to the usual progress of such cases, should cease within a year or more.

CASE 2.—The sister of the first patient is now 3 years and 9 months old, and is of the same type as her brother—small, thin, active, and neurotic. She was born without instruments and nursed for nine months, with occasional substitute cow's milk feedings. She suffered less from vomiting and indigestion than her brother did, but experienced considerable difficulty when put on cow's milk entirely. It was then found that her capacity for fat was decidedly limited, and it was a number of months before she could take whole milk. Like her brother, she has had measles and whooping-cough. At about a year and a half she had her first attack of severe vomiting, which was accompanied by acetonuria. Since then she has had four recurrences, all associated with prostration, moderate emaciation, and the presence of acetone and diacetic acid in the urine. It is noticeable that these attacks are not as yet so severe as those of her brother, though it is possible that they may be as the child grows older. During the last recurrence, which was of recent date, the vomiting was of only moderate severity, but more stupor than usual developed, and delirium, lasting for about an hour, made its first appearance. In prognosticating the future of this case, it would seem probable that the child will follow a course similar to that of her brother, inasmuch as ordinary methods of treatment, diet, and hygiene seem to have little effect on the course of the disease.

139 Park Street.

Therapeutics

CHOREA

The condition to which this name is applied is so little understood that Dr. George Montague Swift's discussion of it in the *American Journal of the Medical Sciences*, for September, 1909, should attract special attention. He declares chorea, i. e., incoordinate, involuntary muscular movements, to be a symptom and not a disease. Also asserts that large doses of arsenic are dangerous. Swift has seen from the arsenical treatment of chorea hemorrhage from the stomach, hemorrhage from the kidneys, severe irritation of the conjunctivæ, and neuritis. It is no uncommon thing to see tedious gastro-intestinal inflammation and albuminuria, showing kidney irritation, from large doses of arsenic. Serious anemia can also be caused by pushing arsenic, and neuritis, even general multiple neuritis, may be caused by the misuse of this drug.

Swift believes chorea to be a symptom of several kinds of cerebral irritations, and he divides the causes, in children, into two principal classes. In Class 1 the symptom of chorea is caused by too great mental and physical activity, and consequently mental tire. In Class 2 the cause of the symptom of chorea is an infection.

Class 1 is probably the larger class, and the muscle contractions and incoordinate movements are a symptom of debility caused perhaps by a severe illness, or more frequently by overwork in school or at home, in the endeavor of parents to push their young girls, especially, to acquire quickly various accomplishments, added perhaps to the fad of the age for an undue amount of physical exercise. In other words, the young girls, and the boys also, have but few periods of rest, and hasten, as do business men and society women, from one appointment and occupation, pleasure, exercise or function to another, as rapidly as possible. Even in the home something is doing every minute. Soon these poor tired children begin to eat insufficiently, do not sleep well, and become anemic and chlorotic.

Even very young children, babies, have too much done for them, are amused too much, talked to too much, played with too much, and, as Swift says, are walked too much. The result is nervous exhaustion. There may be tantrums and explosions of temper, but all represent brain and nerve tire, and the choreic movements are but symptoms of this condition.

Swift puts such patients "to bed in a quiet room, relieves their anxieties," aids sleep, if necessary, and "stuffs" the patients with nutritious food. He administers iron, bone marrow, fats, and cod-liver oil, if advis-

able. If the choreic movements are sufficient to cause restlessness and prevent the child from sleeping, he gives, temporarily, sedatives, as "bromids, codein, and trional or veronal" sodium. Just as soon, however, as there is some improvement he sends the patient into the country or to the seashore for fresh air and quiet.

There is no question of the advantage of the fresh air and rest cure for these patients; in fact, it is often best to move them, even though quite ill, and the seashore and the sea breezes are probably better than country air for them. All the various addenda to the rest cure for neurasthenia should be taken advantage of as soon as possible, viz.: warm, non-stimulating baths, massage, and later graded simple physical exercises.

Swift's second class of causes of choreic movements is the class due to infections, which may be "rheumatic, malarial, pneumococcic, or typhoid." He well says that since there are probably several varieties of germs which cause rheumatic affections, there are probably several varieties of these rheumatic germs that cause a development of choreic movements. Such infections, especially the rheumatic infections, predispose to endocarditis and even pericarditis. These infections may cause sufficient anemia, malnutrition and irritation of the nervous centers to account for the muscle contractions. The endocarditis develops slowly in these cases and should be carefully watched for, and Swift thinks that a weakened heart from these infections can become suddenly dilated by any severe muscle exercise, and even by a severe nervous strain, as by a tantrum.

In these patients, of course, rest in bed is imperative. The medicinal treatment depends on the germ that is infecting the patient. All channels of entrance of infection should be removed as soon as possible, such as "diseased tonsils, postnasal adenoids, and decayed and decaying teeth." Gastrointestinal fermentation should be prevented.

It is probable that the germs that cause rheumatism and the chorea of infection may enter the blood not only through the tonsils, but often through the intestines, and the drugs found most advantageous in stopping the disease of rheumatism and the so-called disease of chorea, such as salicylic acid in the first instance and arsenic in the second instance, are those that act as intestinal antiseptics, and many times apparently a course of chorea may be shortened with salicylates as well as with arsenic, and with much greater safety.

The seriousness of chorea in its ability to injure and change the mental health of the child, even perhaps impairing its future, should cause parents and physicians to be ever on the alert to forestall the incidence of the condition. All brain tire should be prevented, and the moment that a child is found not to sleep well, not to eat well, and to become pale should be the moment that rest and proper treatment is inaugurated.

The severe form of chorea, so-called chorea major, in which the movements are so constant as to exhaust the patient and to cause death, is probably due to septic conditions and malignant endocarditis. Fortunately this form of chorea is rare. The child must be given rest, even if it requires very large doses of chloral, and the other treatment is that of septic poisoning. The blood should be examined for bacteria, and if possible the proper antitoxin administered.

PULMONARY TUBERCULOSIS

In spite of all that has been said on the subject of diagnosing and treating this disease in its incipiency, the statistics of sanatoria for tuberculosis, and the continued frequency with which patients, who have been neglected, come to the lung specialist, call for continued comment and discussion.

Not more than one-third, and often less than one-fourth, of patients received at sanatoria have the disease in its incipiency. This is statistical proof of either a lack of diagnosis or the desire of physicians to make the attempt to cure patients outside of an institution. As most of these institutions are charitable, and therefore are expected to treat and care for patients only who need charity, the hardship on the physician from sending a patient to an institution, as soon as he discovers that the patient has the disease, cannot be great.

It is not the purpose of this article to urge that a patient be sent to an institution who can pay his physician for his services, who can be at rest more or less constantly in the open air in a location removed from a city's dust and smoke, who can receive the proper kind of food, and who will not be fretted by household worries and ill-judged and tiresome visits from friends. It is the object of this article to urge that when all these advantages cannot be offered a patient, he be sent to an institution equipped and properly located for the treatment of this disease, and be sent to such an institution before his lungs have become seriously affected.

The advantages of a sanatorium in the treatment of this disease, from the standpoint of rest alone, are just as great as are the "rest" advantages in a sanatorium for the treatment of neurasthenia.

When 50 per cent. of all patients received at the best sanatoria, even including those in the more advanced stages, have the disease arrested and are able to return to their occupations and usual life, and when from 75 to 80 per cent. of incipient pulmonary tuberculosis patients are able to leave institutions with the disease arrested and able to work, there can be little excuse for not sending patients with incipient tuberculosis to sanatoria.

No one will assert but that a certain number of these patients will have a recurrence of the disease, but the fact that the disease is arrested at all in such a large number of patients, when properly treated in sanatoria, is little less than miraculous when the disease is viewed from the standpoint of even twenty-five years ago.

It is not necessary to enumerate the early signs and symptoms of pulmonary tuberculosis, but a few suggestions expressed by Dr. Henry F. Stoll, of Hartford, Conn. (*Yale Medical Journal,* March, 1909) will be of value.

A patient who shows debility, unless a satisfactory diagnosis of the cause is immediately made, should not be dismissed without a thorough physical examination, which, as Stoll says, will take at least from 30 to 45 minutes. If such a patient comes during a busy office hour, a special appointment should be made for him.

Stoll reminds us that:

"1. Patients with incipient tuberculosis do not usually look ill.

"2. A complete history is often of more value than a physical examination.

"3. The absence of physical signs and the failure to find tubercle bacilli in the sputum do not in themselves exclude tuberculosis.

"4. Pulmonary hemorrhage in a young adult, even without symptoms or physical signs, and with normal temperature and pulse, should always be considered to be due to tuberculosis, until it can be proved to be due to some other cause."

Many times the tuberculin skin test will clear up an otherwise doubtful case.

New and Nonofficial Remedies

SINCE THE PUBLICATION OF THE BOOK "NEW AND NONOFFICIAL REMEDIES, 1909," THE FOLLOWING ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK ARE ASKED FOR.

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN RECOMMENDATION, BUT THAT SO FAR AS KNOWN IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

DIGITALEIN CRUDE.—Digitaleinum Crudum.—Digitalein crude is a mixture of glucosides from digitalis purpurea prepared according to the process of Schmiedeberg, containing digitoxin, digitalin and digitalein.

Commercial digitalein is an amorphous, yellowish-white, bitter powder, soluble in water and absolute alcohol, insoluble in chloroform and ether. The aqueous solution foams on shaking. The solution yields a precipitate on addition of lead acetate, ammonia water or tannic acid.

Actions and Uses.—Digitalein acts on the heart like digitalis. It is a diuretic.

Its uses are the same as those of digitalis.

Dosage.—0.001 to 0.002 Gm. (1/60 to 1/30 grain) two or three times a day.

SUPRARENALIN.—(See N. N. R., 1909.)

Suprarenalin Inhalant.—A 1:1000 solution of suprarenalin in an aromatized oil, containing approximately 10 per cent. of alcohol.
Manufactured by Armour & Co., Chicago.

BILE SALTS—(See N. N. R., 1909.)

Proprietary Preparations:

BILEIN—Sodii glyco-taurocholas bovis—Abbott.—Bilein is a name given to a mixture of the essential salts of the bile.

Actions, Uses and Dosage.—See Bile Salts, N. N. R., 1909.

Manufactured by the Abbott Alkaloidal Co., Chicago. U. S. Trademark No. 44,140.

Bilein Pills, 1/4 grain.—Each pill contains bilein 0.015 Gm. (1/4 grain).

Bilein Pills, 1/8 grain.—Each pill contains bilein 0.008 Gm. (1/8 grain).

Bilein Pills, 1/12 grain.—Each pill contains bilein 0.006 Gm. (1/12 grain).

Prepared by Abbott Alkaloidal Co., Chicago.

IODONE OIL—Oleum Iodoni.—Iodone oil is a 2 per cent. solution of iodone crystals (See Iodone Surgical Dressing and Dusting Powder) in a mixture of alcohol, castor oil, and cotton seed oil. It is said to yield about 1 per cent. of iodine, slowly liberated on prolonged contact with moisture and to contain about 20 per cent. alcohol.

Iodone oil is prepared by dissolving iodone crystals in the mixture of alcohol and oils to which sufficient iodine has been added to overcome the decomposing effects of the solvent on iodone.

It is a clear dark reddish-brown oily liquid, having a specific gravity of about 0.912 at 25° C. (78° F.) and a faint alcohol-like odor.

When shaken with chloroform and water the chloroform acquires a violet color, which is decolorized by shaking with a solution of sodium thiosulphate.

If 5 Cc. of the oil is dissolved in 15 Cc. of chloroform and treated as under iodone ointment, considerable time being allowed during the titration for the complete liberation of the iodine (at least twenty-four hours), about 1 per cent. iodine, calculated from the volume of volumetric sodium thiosulphate solution, should be indicated.

Actions and Uses.—Iodone oil has the germicidal and alterative actions due to the iodine which is liberated on contact with moisture.

It is said to be useful in all catarrhal affections of mucous membranes, hay fever, etc.

Dosage.—Its employment should be regulated on the basis of its liberating 1 per cent. of iodine on contact with moisture. It may be applied as a spray or on pledgets of cotton or tampons. It can be injected hypodermically into tuberculous joints, etc.

Manufactured by the Henry C. Blair Co., Philadelphia, Pa. No patents or trademarks.

IODONE OINTMENT—Unguentum Iodoni.—Iodone ointment is a mixture of iodone crystals with petrolatum, said to contain about 4 per cent. of iodone and to yield about 2 per cent. of available iodine slowly liberated on contact with moisture.

Iodone ointment is a dark green unctuous mass, having the consistency of petrolatum and a faint iodine-like odor.

A small amount dissolved in chloroform in a test tube and shaken with water should impart to the chloroform a violet color, which is destroyed by addition of sodium thiosulphate solution.

If 2 to 3 Gm. of iodone ointment is weighed and dissolved in 15 Cc. of chloroform; 30 Cc. of water added and shaken frequently during one hour; the mixture titrated with tenth-normal sodium thiosulphate solution using starch as indicator, not less than 2 per cent. of iodine should be indicated.

Actions and Uses.—Iodone ointment has germicidal, alterative and stimulant powers due to the iodine liberated.

It is said to be useful in all conditions in which the local use of iodine in ointment form is indicated.

Dosage.—Its employment should be regulated on the basis of the liberation of 2 per cent. of available iodine on contact with moisture.

Manufactured by the Henry C. Blair Co., Philadelphia, Pa. No patents or trademarks.

BISMUTH BETA-NAPHTHOLATE—Bismuthi Beta-Naphtholas.—Bismuth beta-naphtholate is the bismuth salt of beta-naphthol.

Bismuth beta-naphtholate occurs in the form of a brownish or grayish powder without odor, almost tasteless and insoluble in water. It is slightly soluble in alcohol.

1 to 2 Gm. bismuth beta-naphtholate is shaken in a separator during one hour with 25 Cc. chlorform and 25 Cc. concentrated hydrochloric acid, and then 50 Cc. water added and again shaken. The chloroform solution drawn off and the acid mixture extracted with three more portions of 10 Cc. chloroform and the combined extracts evaporated and dried to constant weight over sulphuric acid, a residue should remain weighing at least 15 per cent. of the material used, and should respond to tests of identity for beta-naphthol.

The acid solution from which the naphthol has been extracted is transferred to a beaker, diluted to 200 Cc., heated to boiling, ammonia water added till turbidity appears, then sufficient hydrochloric acid to clear up the turbidity and then 50 Cc. of 10 per cent. ammonium phosphate solution is added to the boiling liquid. The precipitate is allowed to subside, the clear liquid decanted through a tared porcelain Gooch crucible, the precipitate washed with hot water by decantation and finally transferred completely to the crucible. The precipitate and crucible are dried, placed in a nickel crucible, and exposed to the full heat of a bunsen flame till the weight is constant. The weight of the resulting bismuth phosphate multiplied by 0.6869 should yield a figure (representing bismuth, Bi) equal to not less than 60 per cent. of the material taken.

1 to 2 Gm. bismuth beta-naphtholate is weighed to a small asbestos plugged percolating tube, 5 Cc. chloroform added, mixed by means of a glass rod, and allowed to percolate into a tared dish. When the liquid ceases to drop, a further portion of 5 Cc. of chloroform is poured into the percolator and also allowed to percolate into the tared dish. The stem of the percolator is washed with a little chloroform, and the combined washings and the percolates allowed to evaporate spontaneously and the residue brought to constant weight over sulphuric acid. The residue should not exceed 1 per cent. of the material taken.

Actions and Uses.—Bismuth beta-naphtholate is decomposed into its constituents in the intestines, where it exerts the effects of bismuth salts and of beta-naphthol. Hence it is used in catarrhal and fermentative gastroenteric disorders, such as gastritis, dysentery, diarrhea, etc.

Dosage.—For children 0.1 to 0.3 Gm. (1½ to 5 grains) and for adults 1.5 to 5 Gm. (22 to 75 grains) daily.

A mixture of beta-naphtholate with acacia should be avoided as a viscid precipitate rapidly becoming hard is likely to be formed.

Proprietary Preparation:

ORPHOL.—A name given to bismuth beta-naphtholate.

Manufactured by the Chemische Fabrik von Heyden, Radebuel near Dresden, Germany (Schering and Glatz, New York). U. S. patent No. 51635. U. S. trademark No. 27482.

Orphol Tablets.—Each tablet contains orphol, 0.3 Gm. (5 grains).

Non-Proprietary Preparation:

Bismuth Beta-Naphtholate.—P-W-R.
Manufactured by the Powers-Weightman-Rosengarten Co., Philadelphia.

ARTICLES ACCEPTED FOR N. N. R. APPENDIX

Manhattan Eye Salve Co., Owensboro, Ky.

Compound Yellow Oxide and Adrenalin Ointment (M. E. S. Co.)—An ointment said to contain yellow oxide of mercury 1 per cent., solution of adrenalin chloride 5 per cent., menthol 0.04 per cent., phenol 0.2 per cent., hydrous wool fat 25 per cent., white petrolatum sufficient to make 100 per cent.

Cocaine and Adrenalin Ointment (M. E. S. Co.)—An ointment said to contain cocaine hydrochloride 2 per cent., solution of adrenalin chloride 17 per cent., hydrous wool fat 25 per cent., white petrolatum sufficient to make 100 per cent.

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[*For other information see second page following reading matter*]

SATURDAY, DECEMBER 18, 1909

AN ANTIVIVISECTION EXHIBITION

An antivivisection exhibition has been on view for two weeks at a busy point on Fifth Avenue, New York. Most of the exhibits belong to the American Antivivisection Society of Philadelphia. These exhibits were displayed in Philadelphia last spring and again at Atlantic City last summer. The American Antivivisection Society plans to make the show permanent and to send it extensively through the country (to Washington, Chicago, Los Angeles, and other cities) to "educate" people regarding the "horrors" of the laboratory use of animals. This program renders desirable a consideration of the features of the display and their significance.

The center of agitation in the exhibition is an array of animal holders. Various forms of this apparatus are displayed, some of them prominently in the front windows, to attract the attention of the passing crowd. There are six stuffed dogs, among them a lap-dog and other pets, fastened in distressful positions in the holders. An attendant informs the visitors that animals are thus fastened down in laboratories. She is careful to make no mention of anesthesia.

Any sympathy roused by the dead dogs in the holders is intensified by the paintings and prints on the walls, representing dogs fastened and gagged in various positions of torture. When an attendant was informed that one of the pictures could not possibly represent a conscious dog, since the dog, free to struggle, was evidently not struggling, she replied: "Doubtless the dog is curarized, and, though in great pain, is unable to move." When informed that the dog must be dead, because a curarized animal cannot breathe, and this animal was not receiving artificial respiration, she was without further resource.

An attendant, when asked why the head-holders were used, declared that their purpose was to break the jaws of the dogs. Why apparatus was used to break the jaws of dogs, she did not know.

Besides the dogs fastened in holders there is another dog, an attractive little terrier, stuffed in a sitting posture, with a tracheotomy wound in the neck, painted red. This dog is introduced as a victim of vivisection. None of the conditions of the operation could be learned. Probably, if the animal was operated on before death, it was completely anesthetized during the operation, and passed from anesthesia to its place in the exhibit, but the visitor is permitted to draw quite different inferences.

A stuffed fish resting on a board, a stuffed pigeon fastened to a support, an enormously overstuffed cat gagged and strapped to a holder, complete this "revelation" of methods of handling animals.

Near by, however, over a row of gas-burners, is an oven in which lies a stuffed rabbit, its mouth widely opened, as if gasping for its last breath. An attendant informs the visitor that this oven is used in laboratories to roast animals alive and, as they die, to study "nerve action and the circulation." The oven is an ordinary incinerator used in laboratories to burn waste and refuse!

The remaining features of the exhibit are on the walls. There are two entirely fanciful pictures of Pawlow dogs, representing them, quite falsely, as wasted, miserable creatures, sick unto death. There are eleven characteristically malicious and untruthful cartoons from *Life*. There is an enlarged illustration from Cyon's "Methodik" (Plate xv) showing a dissection of the salivary glands, and below it is stated: "This agonizing and hideous mutilation is performed without anesthetics," a falsehood. There is an oil painting of a rabbit stretched as if crucified, with a nail driven through each foot; from each wound blood is flowing, a picture to harrow the heart of the onlooker. What possible reference has this to any laboratory procedure? Another painting represents a dog strapped and gagged, but evidently struggling, while two men, armed with knives, gaze at the bloody gaping wound in its abdomen, with glee on their faces.

Such is the travesty on medical research presented to the public by the antivivisectionists. The untruth of the details has been stated, but the wickedly suggestive implications which make the very atmosphere of the display cannot be adequately described. The fundamental evil of the exhibition is the presentation of a false alternative. The picture of a dog bringing succor, and of another dog bound to a holder, entitled, "The Way They Treat Us" and "The Way We Treat Them," sums up the situation. If that were all, nobody would hesitate on which side to stand. It is no wonder that nearly fifty portraits of poets, novelists, statesmen, artists and clergymen, whose words express their objections to cruelty, have been collected to adorn the walls of this exhibition. Every decent man is opposed to cruelty. But that is not the question. It would be as fair to set up a picture of Grenfell stabbing his faithful dogs to death, labelled "Is This the Way to Treat Your Pets?" as it is to represent medical research as this grotesque show represents it. Grenfell killed his dogs to save his life, and every man with common sense commends his bravery, resourcefulness and proper sense of values.

The high purpose of medical research and its beneficent results for human welfare—the compelling motives of that investigation which utilizes animals, and the care

taken for the comfort and health of the animals, in laboratories—these conditions, which alone give meaning and possibility to medical investigation, are kept carefully in the dark.

The visitors at the exhibition are mainly women, though many children, some quite young, have been seen gazing at the horrifying sights. The attendants are women—women who have never seen the inside of a laboratory of medical research, and who let their morbid imaginings take the place of facts. They move about among the visitors making insinuating remarks and stating falsehoods with an easy assumption of knowledge they have never possessed. They show an instrument-maker's catalogue to prove the truth of their representations—again with no mention of anesthetics. A catalogue of the instruments used in surgical operations on man could be used with the same sly suggestion of torture. As the visitors leave, the attendants hand them circulars containing garbled statements, misleading quotations, and reiterated falsehoods, the untruth of which has been often pointed out. Thus the exhibition is untrue in its representations, evil in its implications, and altogether harmful in its possible effects.

When the exhibition was at Atlantic City last summer the Philadelphia *Ledger* was moved to state editorially:

"It is really a serious concern that a number of good women, or others, should devote their labors to harrying the nerves of the crowd and inciting them to ignorant hostility against the humane studies which have done so much for the service of mankind. The public exhibition of an anatomic museum would be in any case an offense against taste and decorum; when it is employed for misrepresentation and obscurantism and for the propagation of false sentiment, prejudice and intolerance, it is proper to speak of it only with the most serious condemnation.

"Utterly preposterous as the 'chamber of horrors' on the Boardwalk must appear to all who know anything of the subject it pretends to illustrate, it yet has its serious aspect, as an attempt to play on ignorant emotion and to create a false sentiment in support of an unscientific, unreasonable, inhumane effort to impose indiscriminating and injurious restrictions on the acquisition of knowledge that is for the advantage of all living creatures."

When a lay paper takes such a stand as that, it is high time that members of the medical profession awaken to the harm that the opponents of research are doing. The public is being educated, but the ignorant are being led by the ignorant. If medical investigation is not to be seriously hampered in this country, those who do not know must be led by those who do, and must be taught to see the importance to the general welfare of the efforts which are being made in the medical laboratories, with the help of lower animals, to penetrate the mysteries of disease and death that confront mankind on every side.

THE BIOLOGIC RELATIONSHIPS OF THE BACTERIA

Discussions of the affinities of bacteria with other organisms, their phylogenetic relations to the higher plants and animals and the principles of classification within the group itself have often resulted in much uncertainty and difference of opinion. While it cannot be said that general agreement on these topics has yet been reached, there is no doubt that recent investigations into the physiology of bacteria have effectually disposed of some speculations once current. The position which bacteria occupy with reference to other groups of living organisms is to-day better defined than ever before.

The value of morphologic characters as a basis for determining bacterial relationships is evidently not so great as that of the physiologic manifestations of these organisms. This is so, not only because external structural characters are not easily studied in organisms that lie close on the borders of invisibility, but because internal—that is, physiologic or, perhaps more exactly, chemical—qualities are the more fundamental. The outer form is determined by the internal constitution and not the reverse. For these reasons some of the most recent attempts to classify bacteria and to establish their relationships to other forms of life have been based on physiologic grounds. Reference has already been made[1] to the excellent monograph of the Winslows on the classification of the micrococci. These authors essayed to bring order into the welter of genera, species and varieties that long existed in this important group of bacteria and they adopted for this purpose chiefly physiologic distinctions. The same principles have been more recently utilized by Jensen in his ambitious attempt to construct a "natural"—that is to say, genealogical—classification of bacteria.[2] Jensen very properly takes advantage of the significant discoveries of the last few years regarding the physiologic activities of certain bacteria. Three chief groups are distinguished:

1. Bacteria which are like the green plants in requiring neither organic carbon nor organic nitrogen. These are the so-called autotrophic bacteria, which possess the remarkable property of being able to build up both carbohydrates and protein out of carbon dioxid and inorganic salts.

2. Bacteria which need organic carbon compounds, but can dispense with organic nitrogen. These organisms can synthesize protein out of carbohydrates (or organic acids) and ammonia, nitrogen or nitrates.

3. Bacteria which are like the animals in requiring both organic carbon and organic nitrogen compounds. This group cannot bring about either protein or carbohydrate synthesis out of inorganic substances.

These fundamental subdivisions serve to illustrate the method followed by Jensen in drawing up his out-

1. The Classification of Bacteria, THE JOURNAL A. M. A., Jan. 23, 1909, liii, 309.
2. Jensen: Centralbl. f. Bakteriol., II., 1909, xxii, 305.

line of a natural system of bacterial classification. It is sufficient to say that the other groupings suggested by this author are equally logical and are based on recent physiologic studies. Some conclusions of general interest may be noted. The mode of nutrition of the first-mentioned—autotrophic—group of bacteria points to them as being in all probability the first living organisms to appear on the earth's surface. Both plants and animals originated from such a parent stock, Jensen's opinion being that the animals—flagellates—were first to appear. At all events, bacteria probably gave rise, on the one side, to the protozoa, on the other to the blue-green algæ.

The nutritional requirements of the second and third groups, as above specified, indicate that these bacteria are phylogenetically younger than the first group. By the same mode of reasoning, the carbohydrate-fermenting organisms are older than the typical bacteria of nitrogenous putrefaction, and, to carry it still further, the lactose-fermenting varieties are of more recent origin than those related varieties which are not able to attack this carbohydrate, since lactose became available as a food-substance only with the relatively late advent of mammals. Again, the gelatin-liquefying species have developed, as a rule, out of the related non-liquefying species, since protein decomposition, which is itself one of the later acquisitions of micro-organisms, is facilitated by the secretion of proteolytic enzymes. The parasitic bacteria are naturally of more recent origin than the related saprophytic forms. Jensen finally constructs a very interesting genealogical tree which makes plain the relationships of the bacteria to the *Protozoa* and the *Cyanophyceæ* (blue-green algæ), shows a possible connection through the *Actinomycetes* with the *Eumycetes* (molds), and gives also a good conception of the physiologic relations between existing groups of bacteria.

Any attempt to bring the hazy realm of micro-organic life into orderly relation with the better-known macroscopic living world must be welcomed. Jensen's very interesting and ingenious effort has a value, possibly only provisional, but not to be overlooked for the present.

OLD MEXICAN MEDICINE

American historians, especially W. H. Prescott and H. H. Bancroft, have called attention to the fact that medicine reached a very high development among the Mexicans before the coming of Cortés. Their hospitals were well arranged, numerous, and existed in nearly every part of the country; and the traditions of treatment and the observations made on patients raised the art of healing to a high plane. The knowledge of plants was extensive, and even the science of diagnosis was notably developed. Women as well as men practiced medicine, and the department of women's diseases was exclusively in their hands. Indeed, medical traditions were so advanced as to make students of the history of medicine doubt whether such a high development of medical art and science could have been attained among a people apart from the great stream of medical tradition in Europe. There are records of cases in which European physicians failed and Mexican practitioners were successful. Cortés and his men were so well treated, both for wounds and for ailments of various kinds, that the former is said to have asked the Spanish government not to allow physicians of the Old World to come to Mexico.

A recent work by A. Gerste[1] on the medicine and botany of the ancient Mexicans gives very interesting information on this subject. The profession of medicine in Mexico, as in other countries—notably Ireland—was a family inheritance; and the secret medical formulas used by the Aztecs were transmitted from father to son. Their remedies were mainly herbal and of many different classes—antidotes, diuretics, depuratives, emetics, emollients, febrifuges, laxatives, purgatives and vermifuges. The seeds of a certain plant, not now to be readily identified, were used to make an intoxicating liquor that was given for anesthetic purposes to patients on whom an operation was about to be performed. Sahagun describes a solution which the Mexicans applied to wounds to make them heal rapidly and smoothly, and which, in Gerste's opinion, had the effect of an antiseptic. The Mexicans used a number of means to arrest hemorrhage, among them a stone applied to the back of the neck to stop bleeding of the nose. They used their remedies in many forms, as decoctions, infusions, oils, unguents and plasters; and certain gums and resins were used as electuaries. Hydrotherapy was considerably resorted to, and vapor baths were commonly employed.

As a consequence of the interest of the Aztecs in medical botany, botanical science was much farther advanced among them than might be expected. Gerste does not hesitate to say that their botanical knowledge was far ahead of that of the European world of their time. Their classification of plants was superior to that in use in Europe. Several centuries before the genius of Linnæus substituted for long descriptive terms the concise designation by means of a generic name and a specific epithet, the Aztecs had a botanical nomenclature resembling this in some particulars and distinctly superior to that of contemporary Europe. Besides they laid the foundation of geographic botany which is usually supposed to be of much more recent origin and traced the influence of temperature and elevation on plants in a scientific way. Their knowledge was imperfect, but showed many signs of fine powers of observation and abundant research.

The Duc de Loubat, at whose expense these notes have been published in their present form, has placed

1. Gerste, A.: Notes sur la médecine et la botanique des anciens Mexicains, Rome, Imprimerie Polyglotte, Vatican, 1909.

the world of letters under renewed obligations, for in recent years he has shown himself an intelligent and beneficent patron of history and literature by the republication of many important documents relating to America.

THE PRESENT STATUS OF THE ARMY MEDICAL CORPS

But a few years ago the matter of maintaining the personnel of the Medical Corps of the Army at the authorized quota was a subject of grave concern to the Surgeon-General's office. Numerically, the corps, as authorized by Congress, only distantly approached the real needs of the service, and the slow influx of young men was such that the vacancies annually occurring were by no means filled by the applicants accepted at the annual examinations. For instance in the year 1907 there were sixty-four applicants, of whom ten were accepted for the Army Medical School in October, and subsequently commissioned as first lieutenants in June, 1908. The vacancies occurring from October, 1906, to October, 1907, totaled eleven. It is thus seen that the vacancies naturally occurring exceeded the new admissions to the corps during that year. In May, 1908, an examination of fifty-eight candidates gave nine qualified men. In August, 1908, four months after the passage of the reorganization bill, the figures became one hundred and twenty-eight for applicants and twenty-five for accepted candidates. There had been but a brief season in which to bring before the medical profession of the country the greatly increased advantages carried with a commission in the Medical Corps by virtue of the act passed last year, which reorganized the body and provided substantial increases in pay and promotion. In the period between October, 1908, and the same month of this year, the knowledge of the signal improvement worked by the new legislation was more widely diffused and the result is striking. The change is manifest in the number of applicants and accepted candidates, and when the later figures are compared with those of previous years it is evident that the recruitment of the corps is vigorously healthy. The records show that in January and July, 1909, two hundred and seventy candidates were examined and fifty-seven accepted, and the attendance at the Army Medical School in Washington this year is fifty-eight as compared to ten in 1907 and thirty-three in 1908.

Evidently there has been an awakening among the young medical men to a better understanding of the desirable features of an army medical officer's career. Pay and promotion are now on such a scale as to justify any young physician in considering the career, and in recent years resignation after admission is almost unknown, which shows that, when once identified, practically all are willing to remain.

There is now opportunity for scientific work and it is possible for any member of the corps, who has the necessary capabilities, to rise to the plane of Sternberg, Reed, Carroll, Gorgas and many others in the field of preventive medicine, and every incentive is given the internist, surgeon and bacteriologist in his chosen work.

The Army Medical Corps was never so full of promise to young men, and appreciation of its great opportunities was never so manifest as at this time. A significant feature of the situation at present is the fact that so many applicants are drawn from the staffs of the larger hospitals in the country. The course of instruction at the Army Medical School, including, as it does, special training in bacteriology, sanitary chemistry, tropical medicine, military surgery and hygiene, supplies a post-graduate opportunity of exceptional character and the result has been one of great uplift in the professional equipment of the medical officer. The fact that the student officer is paid over $200 a month while in attendance at the school impresses one that the government is earnest in its effort to develop the Medical Department of the Army.

IMPURE DRINKING WATER ON LAKE VESSELS

The Public Health and Marine-Hospital Service for some time has made a study of the spread of typhoid fever by railroads and steamships. The opportunities for the investigation of typhoid dissemination by means of the railroads have not been good, but through the system of marine hospitals it has been possible for the service to study typhoid in certain of its relations to ships. These studies have shown that the typhoid rate is higher among sailors than among men of the same age-periods in the ports made by the sailors. In addition, there has occasionally been an opportunity of studying an epidemic of typhoid among a group of people who were passengers on shipboard at the time of probable infection.

As there have been found good reasons for believing that ships were in some measure spreaders of typhoid among their crews and passengers, it is evident that there is some hygienic error on ships, either in construction or custom, or both. The very palpable errors in both construction and custom are set forth in Dr. Cobb's article in this issue on "Water Contamination Aboard Ship and Its Prevention."

Properly kept storage tanks for drinking water are not an unreasonable requirement, and can be demanded under present powers of the Department of Commerce and Labor. This should and must be done.

In addition to the large number of men who constitute the crews, there are the great multitudes who are passengers whose rights and interests must be conserved. Boats which ply on polluted streams should be compelled to use distilled water; those which ply on fresh water lakes would find it preferable to fill their tanks by special tubes after the ship has gone far enough from shore to secure pure water. Obviously ships plying fresh waters must be made by government to change their

drinking-water methods. Polluted fresh water is no more fit to be sucked up through sea-cocks for drinking purposes than is salt water.

There is another phase of the relation of ships to the spread of typhoid which is even more important than that investigated by Dr. Cobb, and that is the disposal of sewage by the ship. At some lake ports it is possible for boats to pour out feces and slops right over the intake of the city's water supply. The psychology of approaching disembarkation crowds the toilet rooms just as the boat is passing the cribs. A large volume of excreta is deposited in the water near the intake. The cure for this situation may lie along any one of three lines: 1. Passenger vessels can require that all toilet rooms be kept locked in certain locations—to be determined in each case. This is the custom at present in vogue on the railroads, and has the advantage of having had its feasibility demonstrated. 2. Ships could be built with holding tanks for slops and sewage—these to be discharged after the ship is well away from intakes. This method would cause less inconvenience to the passengers and is, of course, preferable. 3. The third plan is that suggested by Surgeon Young and Major Judson,[1] namely, to designate certain areas about the cribs as quarantine anchorages which must be avoided by shipping.

The very necessary measures for the control of this noxious situation could easily be interpreted to rest with the Department of Commerce and Labor, the Treasury Department or the War Department. Different bureaus in the first two that might easily find legal warrant for control are those of navigation or the Public Health and Marine-Hospital Service. At any rate, all will agree that the situation demands prompt and effective action by some live government official.

A PLAGUE FOCUS IN CALIFORNIA

Plague foci, permanent in character, have been recognized for years as existing in China, northern India and South Africa. There seems little doubt that another such menacing center of fixed character has developed in California, thus making the fourth of the world's plague foci. In all these foci, or plague centers, the disease is kept in existence through rodents of one variety or another, is mildly epizootic in character and only rarely, under ordinary circumstances, is conveyed to human beings. But it is now thoroughly proved that from these permanent incubation districts the disease is conveyed to man through the intermediary, first of the rat and then of the flea. The reports on plague in California published in THE JOURNAL[2] over a year ago strongly hinted at the fact that a well-distributed infection of ground-squirrels probably existed; the recent work of the United States Public Health and Marine-Hospital Service in charge of Passed Assistant Surgeon W. Colby Rucker, and described by the latter in THE JOURNAL[3] last week, leaves no room for doubt. The work was in an entirely new field of preventive medicine and has been done against the great physical odds of long distances, wild country and burning summer heat; yet in spite of this the reports already presented show that Dr. Rucker has reduced what was formerly only a brilliant hypothesis to a certainty demonstrated in its smallest detail. Plague-infected squirrels have now been found in Contra Costa, Alameda, Santa Clara, San Benito, Santa Cruz, San Joaquin, Stanislaus, Merced and Santa Barbara counties—an area of about five thousand square miles. The eradication of squirrel plague by the extermination of ground-squirrels in such an enormous area is a task so stupendous as to be apparently impossible. Nor is the existence of plague in squirrels without menace to the human inhabitants of the infected area. Within the last few months three cases of human plague have occurred in Alameda County, and in each instance it has been proved that the disease was received from ground-squirrels. In twelve counties of the state, scouting parties are at work, the present object of the United States Public Health and Marine-Hospital Service being to determine, if possible, the extent of the territory infected; in all of this work the California State Board of Health is actively cooperating. It seems hardly necessary to call attention to the very grave menace to the entire country in the existence of this plague focus; it is not a mere local danger, but a national one. It is undoubtedly true that a severe epidemic of human plague could scarcely occur in a vermin-free population; but it is equally true that the infection may be conveyed at any time to any part of the United States, and in very densely populated centers the people are not always vermin-free. The existing facts present a problem both large and of grave import.

THE CURE-ALL IN ANCIENT ERIN

In the little volume on "The Antient Medicine of Erin," issued by Burroughs, Wellcome and Company, there is a paragraph on the announcement of a remedy in Ireland, about a thousand years ago, which ought to make the advertising managers of the nostrums of to-day feel that they are the feeble offspring of a degenerate age. This ancient Hibernian cure-all was claimed to be a preservative from death, a restorative for the living, a compensation for the want of sinews, a remedy for the tongue-tied (under which term were included all those suffering from defects of speech, from true aphasia to stuttering), a cure for swelling in the head, for wounds by iron, or of burning by fire or of the bite of the hound. It further prevented "the lassitude of old age, cured the decline" (by which the Irish have always designated consumption), the rupture of the blood-vessels (mentioned immediately after consumption because of the tendency to hemorrhage), took away "the virulence of the festering sore and the fever of the blood and even the poignancy of grief." The promise was that "he to whom it shall be applied shall be made whole"; and the announcement concludes: "Extolled be the elixir of life, bequeathed by Diancecht to the

1. First Report of the Lake Michigan Water Commission, Urbana, Ill., 1909.
2. Dec. 14, 1908, p. 2000; Sept. 19, 1908, p. 1010.
3. THE JOURNAL A. M. A., Dec. 11, 1909, p. 1995.

people, by which everything to which it is applied is made whole." In comprehensiveness of claims, that certainly leaves little room for improvement. We wonder if some of the credulous in those days did not try the stuff on leaky roofs and ragged clothes.

Medical News

COLORADO

Tag Day in Denver.—The Hospital Saturday and Sunday Tay Day in Denver netted $5,000.

Personal.—Dr. John H. Larson has succeeded Dr. Joseph W. Gothard, resigned, as health officer of Palisades.——Dr. Charles E. Holden, Longmont, is reported to be seriously ill in Orange, Cal.

New Dormitories for State Hospital.—The State Hospital for Insane, Pueblo, is to have three new dormitories, each of which will have accommodation for 75 patients. Two of these buildings will be for women and one for men, and they will cost $50,000 each.

State Antituberculosis Association Formed.—The Colorado Association for the Prevention and Cure of Tuberculosis has recently been organized with headquarters in the Capitol Building, Denver. The organization will endeavor to have tuberculous persons registered, and will teach means of prevention of tuberculosis by continual agitation through the press and through lectures to the public. A tuberculosis exhibit, which has been held for two weeks in Denver, has recently closed.

ILLINOIS

Medical Staff Elects Officers.—The medical staff of the Graham Hospital, Canton, has organized with the following officers: President, Dr. Willis T. Zeigler; vice-president, Dr. Martha A. Richardson, and secretary, Dr. James E. Colman.

Asks for Larger Hospital.—President Busse of the board of commissioners of Cook county, in his annual report, points out the urgent need of a larger hospital. The present hospital, with a capacity of 1,300 patients, has cared for 1,700, the daily average for the year being 1,451. The new hospital should be large enough to accommodate 2,500 patients.

Victory for Pure Food.—Judge J. Otis Humphrey of the federal court, on December 10, is said to have decided that fifty cases of preserved eggs, shipped by the W. H. Hippolite Company, St. Louis, and seized in Peoria last March by government inspectors, were injurious to health and that the seizure was justified. Attorneys for the defense filed an appeal to the United State Appellate Court. Dr. Harvey W. Wiley, Washington, D. C., testified that two pounds of boric acid were used for one hundred eggs.

Personal.—Dr. August F. Bechtold, New Athens, who has been ill with tetanus in St. Elizabeth's Hospital, Belleville, is reported to be out of danger.——Dr. Charles B. Fry, Mattoon, before leaving for Biloxi, Miss., was presented with a diamond stud and Elk charm by the local employees of the Illinois Central Railroad.——Dr. William L. Secor and family, La-Grange, left for Florida December 6, where they will spend the winter. Dr. Secor has been made physician-in-chief of the new Ponce de Leon Sanitarium, St. Petersburg.——Dr. Jesse D. Dickinson, Galva, underwent a second operation at Cottage Hospital, Galesburg, November 22.

District Society Meeting.—The thirty-sixth annual meeting of the North Central Illinois Medical Association was held in Streator, December 7 and 8, and the following officers were elected: President, Dr. Franklin A. Turner, Sandwich; vice-presidents, Drs. Alfred E. Owens, Princeton, and Thomas W. Burrows, Ottawa; secretary-treasurer, Dr. George A. Dicus, Streator (reelected), and censors, Drs. John C. White, Seatonville, Charles A. E. LeSage, Dixon, Joseph I. Knoblauch, Metamora, John M. Kaiser, Somonauk, and Alonzo B. Middleton, Pontiac. Life memberships were conferred on Drs. Charles E. Cook, Mendota, Alfred E. Owens, Princeton, Thomas H. Stetler, Paw Paw, and Benjamin F. Landis, Tiskilwa.

Chicago

Sanatorium for Tuberculous Chicagoans.—A number of Chicago physicians and citizens have inaugurated a movement to purchase the Valmore Ranch near Las Vegas, N. M., and establish a tuberculosis sanatorium for patients of moderate means who may be able to do some work and will be paid for that work. Dr. E. Fletcher Ingals is at the head of the organization and a considerable amount has already been promised for the enterprise.

The Fenger Memorial.—The directors of the Fenger Memorial Association have decided to set aside $400 for 1910 to aid in medical investigation. Application with necessary details should be sent to the secretary, Dr. Ludvig Hektoen, 1743 West Harrison street, not later than February 1, 1910. This appropriation is part of the income of the Fenger Memorial Fund, which was created by subscriptions in honor of Dr. Christian Fenger of Chicago, who died in 1902, and the income is used to further medical investigation.

KENTUCKY

Tuberculin Test for Cattle.—The executive committee of the State Board of Health, meeting with the government experts, who have been making tuberculin tests of the cattle of Kentucky, announces that of 1,703 cattle subjected to the tuberculin test, 16 per cent. were found to be diseased.

City Hospital Condemned.—The November grand jury of Jefferson county considers the management of the county institutions creditable. Praises are given the Blind Asylum and the Lakeland State Hospital; the County Poor House was condemned as unfit to harbor the two dozen inmates; the bakery, dairy, and dining room of the Home for the Aged and Infirm were condemned, and the following report was made on the Louisville City Hospital:

> It is perhaps superfluous to say that this condition is a hundredfold worse at the City Hospital. The venerable building, crumbling to decay, after serving to shelter three generations of the city's sick disabled and unfortunate, is kept as clean as possible, and its inmates cared for with as much comfort as the building will permit. The development of modern hospital design and practice has left Louisville's facilities so far in the lurch that the institution has become a reproach and a disgrace to the community. That it makes better provisions for its malefactors in its jails than for the poor unfortunates huddled in its superannuated hospital bespeaks not a city of progress, as its great seal proudly boasts, but marks Louisville in this respect which should be its chief concern, as the city that has stood still. Efforts to remodel and renovate a hospital which has been in use nearly three-quarters of a century would be as impossible as they would be absurd. Entire replacement of the buildings is imperative, and further postponement of this drastic remedy will be a disgrace to the community.

The mayor of the city has stated that he favors the construction of a new city hospital to cost a million dollars and will urge the voters to endorse the proposition before the next legislature.

MARYLAND

Hospital Organized.—At a meeting held in South Baltimore, presided over by the mayor of the city, with Dr. John R. Abercrombie as secretary, the South Baltimore Hospital was organized and many contributions were received.

Advocates Inspection of Meats.—At a conference, held in Hagerstown Dec. 9, by county health officers and others for the consideration of a state law for the inspection of meat, Dr. Marshall L. Price, Baltimore, secretary of the State Board of Health, presented the draft of a bill, which was held to be too stringent. He was asked to modify and present it again. All present favored the creation of the office of state meat inspector.

MASSACHUSETTS

Sentenced for Manslaughter.—Frank L. Hill, an "herb doctor" of Fall River, who pleaded guilty to manslaughter in connection with the death of Amelie St. John of Woonsocket, R. I., is said to have been sentenced on Nov. 17 to imprisonment for not less than seven or more than ten years in the state's prison.

More Land for Hospital.—The trustees of the Boston State Hospital, with the approval of the governor and council, have purchased a site on Fenwood Road, containing about 90,000 square feet, near the Harvard Medical School, on which a hospital will be erected for the first care and observation of mental patients and the study and clinical treatment of mental diseases.

Personal.—Dr. Myles Standish, Boston, has been appointed Williams professor of ophthalmology in Harvard Medical School.——Dr. George L. Richards has been elected president of the Fall River Antituberculosis Society, and Drs. Joseph A. Barre and Henry A. Rosa, Fall River, and Edward W. Burt, Westport, directors.——Dr. Carl E. Meyer, Chicopee, has been appointed a medical inspector of schools.——Dr. Walter Channing has been elected a vice-president of the Brookline Antituberculosis Society.——Dr. John A. Gordon, Quincy, has been appointed vice-president of the Antituberculosis committee of Quincy, and Drs. T. Ramon Burke, Nathaniel S. Hunting, Willis J. Middleton, Daniel B. Reardon, and John T. Reynolds have been elected members of the board of directors.

NEW YORK

Hospital Site for Buffalo.—Mayor J. N. Adam announced at a meeting of the Tuberculosis Hospital Commission that he intends to buy the Perryville site for the hospital. This site includes 293 acres and the price is $19,650.

County Tuberculosis Hospitals.—Ulster County plans to take over the day and night camp for consumptives established last summer by the local committee on tuberculosis of the State Charities Aid Association and to convert it into a permanent hospital. Similar action has been taken recently by the counties of Monroe, Ontario and Schenectady. Like action is expected soon by the supervisors in some twenty other counties.

State Board Seeks to Prevent Blindness.—A special committee of the New York Association for the Blind which was appointed to investigate the causes of preventable blindness and to cooperate with physicians in seeking measures of prevention, reports that the committee has found that about one-half of all blindness is due to preventable causes and about one-third of the blindness of children is caused by ophthalmia neonatorum. This committee has united with the State Commisioner of Health in enforcing the use of a 1 per cent. solution of silver nitrate. The State Commissioner of Health will endeavor to provide this solution through local health officers to any physician or midwife applying for it. It has been enacted that birth certificates be returned within thirty-six hours instead of ten days as hithertofore.

New York City

Personal.—Dr. and Mrs. Alexander McLane Hamilton sailed for Europe on December 8.——Dr. Daisy M. Orleman Robinson has been elected a member of the Société francaise de dermatologie et de syphiligraphie. Dr. Robinson is the first woman member of this society.——Dr. Walter H. Kerby has succeeded Dr. John P. Schneble as house surgeon of St. Mary's Hospital, Jamaica.

For Cancer Research.—George Crocker, who died on December 4, left property valued at about $1,500,000 to Columbia University, the proceeds of the sale of said property to be used in the prosecution of researches as to the cause, prevention and cure of cancer, and in case the progress of science should at any time make such researches no longer necessary, the fund to be applied to other researches in medicine and surgery as may be determined by the trustees. The fund is at no time to be used for the erection of a building; hence the acquisition of this fund will lay on Columbia University the responsibility of providing a suitable building for this kind of work.

New Hospitals.—Work will soon be begun on the new Bradford Street Hospital which has just received an appropriation of $77,000 from the city. This institution will take the place of a reception hospital and will relieve the Kings County Hospital, which is overcrowded. The entire cost of the building will be $350,000, and it is intended that it will serve as a model in erecting other city hospitals.——The Staten Island Tuberculosis Hospital was already in great part completed when the city gave an appropriation of $1,350,000 recently. One million dollars had already been appropriated. The building can now be completed and will furnish accommodations for one thousand patients.

Buffalo

Personal.—Dr. Joseph Burke has been appointed surgeon of the Sisters Hospital.——Dr. Marshall Clinton has succeeded Dr. William Phelps as attending surgeon at the Buffalo General Hospital.

New County Hospital.—The board of supervisors of Erie county have appropriated $500,000 for the erection of a new county hospital. Further effort is being made for an appropriation of $200,000 for a building for the segregation and treatment of advanced cases of tuberculosis.

Municipal Tuberculosis Hospital.—The Municipal Hospital Commission has selected a site for the hospital at Perrysburg, at an elevation of 1,500 feet. The cost of the site is $19,200, and Mayor Adam has announced that he will pay for it and present it to the city. The hospital will be named the Adam Memorial Hospital, and the buildings are expected to cost about $200,000.

OHIO

Personal.—Dr. Robert Ingraham has been elected a member of the board of education of Cincinnati.——Dr. Louis Schwab, mayor-elect of Cincinnati, has decided to continue to serve on the city hospital medical board until the first of the year.

The McDowell Centenary.—On December 9, under the auspices of the McDowell Medical Society, a banquet was given at the Hotel Alms in honor of the centenary of the first ovariotomy performed by Dr. Ephraim McDowell on Mrs. Crawford, in Danville, Ky., Dec. 9, 1809. More than 150 physicians, many from Kentucky and neighboring states, were present. Dr. Louis Schwab was toastmaster. Dr. S. Cary Swartsel responded to the toast, "Ephraim McDowell," and gave a history of the life of Dr. McDowell, stating that he was born in Virginia, Nov. 11, 1771; married a daughter of the governor of that state; moved to Kentucky, but returned to Virginia to study medicine, and later studied in Edinburgh under Dr. John Bell; located in Danville, Ky., in 1795, where the operation which made his name famous, was performed. The woman lived for 40 years after the operation. Dr. McDowell died at Danville in 1830. A high tribute was paid to Dr. McDowell's services to humanity and to the medical profession. Dr. Fayette Dunlap, Danville, Ky., responded to the toast, "Pioneer Days in the Blue Grass," Dr. Rufus B. Ball, Cincinnati, on "Ephraim McDowell's Influence on Ligatures in Abdominal Surgery," and Dr. John H. Landis, Cincinnati, on "Modern Medical Martyrs." Remarks were also made by Judge McDowell, grandson of Dr. McDowell, and by Dr. Powell, both of Danville, Ky.

PENNSYLVANIA

Medical Club Election.—At the annual meeting of the Oil City Medical Club, December 2, Dr. Fanny Davis was elected president; Dr. John L. Hadley, vice-president; Dr. Sylvester W. Sellew, secretary, and Dr. Frank B. Jackson, treasurer.

Personal.—Dr. Evelyn Dickinson has resigned as second assistant resident physician of the women's department of the Norristown State Hospital for the Insane.——Dr. Charles C. Eicher, McKees Rocks, has been elected president and Dr. J. Donald Iams, Sheridan, treasurer of the Chartiers Branch of the Allegheny County Medical Society, which is taking the postgraduate course suggested by the American Medical Association.

Work at State Tuberculosis Dispensaries.—The State Department of Health has now 114 tuberculosis dispensaries in the commonwealth, new ones having been recently opened at Nanticoke and Brownsville. At present more than 11,000 patients are being treated at these dispensaries. Trained nurses are visiting the homes of the patients, instructing them how to care for themselves, and the other members of the household how to guard against infection. For the month ending October 20, the nurses made 10,338 visits, and during the ten months ending October 20, 76,794 visits were made and 471 patients were discharged from the dispensaries with the disease arrested.

Medical Staff Election.—The Ohio Valley Hospital, McKee's Rocks, at its annual meeting, December 6, elected the following staff for the coming year: Surgery, Dr. Charles G. Eicher, McKees Rocks, chief of staff, and Drs. Joseph G. Steedle and George R. Wycoff, both of McKees Rocks; medicine, Drs. Albert H. Burket, McKees Rocks, R. Hanover, J. Donald Iams, Sheridan, and Dr. Charles B. Keebler, McKees Rocks; and assistants, Drs. J. W. Burkett and William C. Minnich, McKees Rocks; eye, ear, nose and throat, Dr. George W. Beane; genitourinary diseases, Dr. John A. Hawkins, Pittsburg; diseases of children, Dr. George S. Bubb; obstetrics, Dr. John A. Williams, Sheridanville, and neurology, Dr. Christopher C. Hersman, Pittsburg.

State Charity Organization Meeting.—The first Pennsylvania Conference of Charities and Correction was held in Harrisburg, December 6 and 7. Governor Stuart presided at the opening meeting and the address of welcome was delivered by Mayor E. S. Meals. Addresses were also made by F. H. Nibecker of Glen Mills, chairman of the committee on organization, and Francis J. Torrance of Pittsburg, president of the State Board of Charities. At the morning session, P. R. Lee, general secretary of the Philadelphia section for organized charity, spoke on "Needy Families, Their Care and Treatment by Organized Charity." Dr. E. R. Walters, director of Health and Charities of Pittsburg, spoke on "Public Treatment of Needy Families." Papers were also read by Dr. James M. Murdock of the State Institution for Feeble-Minded at Polk, Dr. Henry M. Weeks of the state institution at Spring City, Dr. Frank J. Woodbury of the State Board of Charities, Monsignor J. W. Turner of the Archdiocese of Philadelphia, Professor David Emmert, Huntingdon, and Mrs. J. L. Anderson, Pittsburg. On Wednesday a permanent state organization was formed.

Philadelphia

Charitable Bequests.—A provisional bequest from an estate, valued at $57,500, to the Home of the Merciful Saviour for Crippled Children, was contained in the will of the late Marie

A. Brolesky.——The will of the late Catherine Boyle bequeaths $5,000 to St. Mary's Hospital.

Councils Vote to Buy Poor House Site.—On December 8, the city councils voted to purchase the land between State Road and Holmesburg Avenue and the Delaware river, adjoining the House of Correction, as a site of the proposed new home for the city's indigent. The tract comprises about forty-seven acres and the price to be paid will be about $50,000.

Gift to Jefferson.—Mrs. Henry C. Chapman has presented to the Jefferson Medical College all the laboratory apparatus and equipment used there by her husband, the late Dr. Henry C. Chapman, who was professor of the institutes of medicine and medical jurisprudence in that institution for twenty-nine years. The gift is said to be worth more than $20,000.

Surgeon General in Philadelphia.—Brigadier General George H. Torney, Surgeon General U. S. Army, made a visit to Philadelphia December 6. He was the guest of honor at a dinner at the Union League Club, made an address before the Northwestern Medical Society on "The Experiences of a Doctor in the Army," and was given a reception at the Southern Club in the evening.

Library for Jefferson Alumni.—The College Library of the Jefferson Medical College has a good working library of over 4,000 volumes in the college building in use by the students of the Jefferson Medical College. The alumni of this institution are invited to use the library whenever they are in the city. The library is open practically from 9 in the morning until 5 in the afternoon. It will be found on the first floor of the college building, Tenth and Walnut streets.

Honor Memory of Daring Physician.—A memorial tablet to Dr. Francis Kinloch Huger, of the class of 1797 of the University of Pennsylvania, the work of Dr. R. Tait McKenzie, was unveiled Nov. 5 by Miss Elizabeth Huger, a great granddaughter of Dr. Huger. Dr. J. William White made the presentation speech, and the memorial was accepted on behalf of the university by Dr. Wharton Sinkler. The tablet commemorates the daring attempt of Dr. Huger to rescue Marquis de Lafayette from the fortress of Olmutz, Austria, in 1794.

Personal.—Dr. Guy Hinsdale sailed for Europe, December 11. ——Dr. John M. Swan has been elected associate professor of clinical medicine in the Medico-Chirurgical College.——Dr. Harry Hudson has been elected chief of the orthopedic department of Jefferson Hospital and associate in orthopedic surgery in Jefferson Medical College.——Dr. Joseph Evans has been appointed professor of clinical medicine and medical adviser of students in the University of Wisconsin, Madison.——Dr. J. Frank Meade sustained a loss of about $800 by fire November 16.

Jefferson Hospital Clinical Society.—At a meeting of members of the staff of Jefferson Hospital, December 8, plans were made to form a scientific society to be known as the Clinical Society of Jefferson Hospital. The aim of the society is to encourage members of the hospital staff in research work and the compilation of scientific papers. The society is to meet the fourth Friday night of each month and the meeting for organization will be held on Jan. 28, 1910. The subject for discussion for that time will be "Pulmonary Embolism Following Abdominal Operations."

Plans New Hospital.—Plans have been drawn by Henry L. Reinhold and Lynn H. Boyer for a new building for the Roosevelt Hospital, 710 North Fifth street, the present quarters being inadequate for the demands of the river front and factory territory tributary to it. The new building will be four stories in height, with a frontage of forty feet and a depth of 125 feet, and will accommodate 150 patients. At present, with but fifty beds, the hospital is constantly filled. Since obtaining its charter as a general hospital in 1905, more than 1,700 patients have been admitted to the house and 17,000 have been treated in the dispensary.

Associations Elect Officers.—The annual banquet of the Medical Examiners' Association of Philadelphia was held December 9. Dr. John G. Clark, the retiring president, was toastmaster, and the following officers were elected: President, Dr. Samuel G. Walker; vice-president, Dr. Samuel H. Brown; secretary, Dr. Norris S. McDowell, and treasurer, Dr. George D. Morton.——The West Philadelphia Medical Society held its annual meeting and banquet December 6. The following officers were elected: President, Dr. Sherman F. Gilpin; vice-president, Dr. Hiram L. Lutz; secretary, Dr. Henry G. Munson; financial secretary, Dr. William M. Miller; and treasurer, Dr. Edmund L. Graf.

Baby Alliance Plans Campaign.—The Baby Alliance was formed last May, under the auspices of the Department of Health and Charities, the Board of Education and civic associations of women. The object of this body is to educate mothers in the elementary laws of hygiene and to establish milk stations, providing pure milk. A committee of seven met in Director Neff's office in City Hall and heard a paper read by Dr. Frank N. Yeager, infant mortality specialist of the city. He showed by statistics gathered by himself that one-half of the infant deaths were of babies of less than one year and that these deaths might easily have been prevented by better knowledge on the part of mothers.

Jonnesco in Philadelphia.—Dr. Thomas Jonnesco, dean of the medical faculty of the University of Bucharest, Roumania, visited Philadelphia, December 13, 14 and 15. He demonstrated his method of spinal anesthesia at Dr. Charles S. Frazier's clinic at the Hospital of the University of Pennsylvania and also of the clinic of Dr. Edward Martin at the same institution. He also gave an illustrated lecture at the University Hospital. On Tuesday at 1 o'clock he outlined his method and gave a demonstration at Dr. E. E. Montgomery's at the Jefferson Hospital and on Wednesday he gave a lecture and demonstration at Dr. W. L. Rodman's clinic at the Medico-Chirurgical Hospital. A dinner was given in his honor by Dr. Charles S. Frazier on Tuesday evening.

WISCONSIN

Lay Medical Journal.—It is announced that Dr. Julia Riddle, Oshkosh, has been elected editor in chief of a new monthly publication to be known as *The Layman's Medical Journal*, having for its object the eradication of preventable diseases. The collaborators on the staff are Drs. Anna B. Corr, Juneau, M. Adeline Riddle, Oshkosh, Belle P. Nair, Fort Atkinson, Johanna M. Droppers, Milwaukee, and Evelyn C. Hoehne, Milwaukee.

Personal.—Dr. Mazyck P. Ravenel, professor of bacteriology in the University of Wisconsin, Madison, has been elected a director of the Madison Antituberculosis Society, and has been appointed official reporter for the International Medical Congress at Buenos Aires, Argentina, in May next, where he will have charge of the tuberculosis program.——Dr. Thomas C. Phillips, Milwaukee, has been made dean and professor of ophthalmology and otology in the Wisconsin College of Physicians and Surgeons.——Dr. Peter B. Stewart, Chetek, is convalescent after a severe attack of pneumonia.——Dr. Wilson H. Van Dusen, Lancaster, who has been ill for several weeks, slipped and fell on a sidewalk Nov. 26, breaking his right arm. ——Dr. Henry T. Brogan, West Allis, has been appointed physician of Milwaukee county.——Dr. L. Rock Sleyster, Appleton, has been appointed physician of the state penitentiary.——Dr. George E. Knauf, Sheboygan, has been elected physician of Sheboygan county.——Dr. Susan Jones, Racine, has been elected secretary of the local society for the prevention of tuberculosis.

GENERAL NEWS AND COMMENT

Society Meetings.—The Missouri and North Arkansas Railway Surgeons Association was organized at Leslie, Mo., Nov. 3, with the following officers: President, Dr. Cyrus F. Crosby, Heber, Ark.; vice-presidents, Drs. T. D. S. McCall, Neosho, Mo., Samuel C. Daniel, Marshall, Ark.; and H. L. White, Rondo, Ark.; secretary, Dr. J. Oliver Cotton, Leslie, Ark., and treasurer, Dr. Asbury J. Vance, Harrison, Ark.——The following officers have been elected by the New England Pediatric Society: President, Dr. Charles P. Putnam, Boston; vice-president, Dr. Philip S. Potter, North Adams, Mass.; secretary-treasurer, Dr. Fritz B. Talbot, Boston, and councilors, Drs. John L. Morse, Arthur H. Wentworth, and Henry I. Bowditch, all of Boston.

The Health of the Army.—The report of the Surgeon General of the Army for the fiscal year just closed shows the lowest ratio of sick admissions on record, 575.47 per 1,000. The constantly non-effective rate for the enlisted strength of the army was 42.68 per 1,000 as compared with 46.17 for 1907 and 49.79 for 1906. The total admission rate was 1188.03 as compared with 1218.26 for 1907 and 1706.33 for 1906. The deaths from all causes were 414, of which 235 were due to diseases, the death-rate being 3.48 per 1,000 as compared with 3.44 for the preceding year. The highest death rates were from tuberculosis, pneumonia, and typhoid fever. The antityphoid vaccination test in the hospital corps has been found so successful that the surgeon general recommends the extension of the vaccination to include volunteers from all organizations to be detailed for duty outside of the United States and among troops to be ordered for special practice or maneuvers. He recommends that a medical officer be attached to the Militia Division to assist in the organization of the medical department of the militia and that the state authorities be

required to equip a field hospital with its ambulance company for each three regiments in addition to regimental medical service.

The Health of the Navy.—The annual report of the Surgeon General of the Navy shows the relation of the different causes of death in the Navy and Marine Corps for the past fiscal year. Drowning heads the list with 47 of the 305 deaths, tuberculosis comes next with 30, pneumonia follows with 24, heart disease with 21, and nephritis with 15. Of the 26,350 sick admissions, 3,015 were due to venereal diseases, 2,631 to tonsillitis, 2,319 to wounds, and 1,677 to suppurative skin diseases. The ratio of admissions and readmissions per 1,000 of the strength for the year was 611.05 as against 630.08 for the previous year, and 649.65 for the decade from 1897 to 1906. The cigarette-tobacco bag is suggested as possibly playing an important part in the transmission of mumps, as the invariable habit of those who use tobacco in this form is to close the sack by pulling the puckering string with the teeth; thus the user of the sack by touching the saliva-soaked bag string may infect himself. Mumps occupies seventh place in the sick admissions, with 1,392, exceeding even the rate for bronchial and rheumatic affections. The insufficiency of the medical force is shown by the fact that less than 248 medical officers are available for the care of the 52,913 officers and men of the Navy and Marine Corps, or 1 to 254. Discontinuance of fresh milk as a part of the Navy ration is recommended, and the use of the Elliott ear protector against injuries by gun-fire is also recommended. Mention is made of the fact that among candidates for enlistment from the northwest, or those born in or long residents of the extreme northwest, thyroid enlargement of varying degrees, is found. The proposal to accept unusual period of watches on deck and in engine rooms for officers on board ship, in lieu of the physical tests of walking and riding does not meet with the approvel of the surgeon general, who believes that such tests will be an index of the moral stamina rather than the physical fitness of the officer.

FOREIGN

Nobel Prize Goes to Kocher of Berne.—The prize for medical research was this year conferred on Theodor Kocher of Berne, where he has been professor of surgery since 1872. He was born at Berne, Aug. 25, 1841, and is thus 68 years old. His fame rests mainly on his research on the physiology and pathology of the thyroid gland, although he is eminent as a surgeon and his "Manual of Surgery" is a classic text-book. His discovery of the cachexia that follows total removal of the thyroid was announced in 1883, and his work on the thyroid and parathyroids has inspired an immense amount of research in all lands. Among his latest works are some on transplantation of the thyroid, the blood picture in exophthalmic goiter, cancer of the thyroid, curability of gastric cancer, hypophysic and other tumors, and means to prevent and cure cretinism.——The professor of chemistry at Leipsic, W. Ostwald, received the chemistry prize, while the physics prize was divided between Marconi of wireless telegraphy fame and F. Braun, professor of physics at Strasburg. Switzerland, Germany, Italy, Sweden and France are represented in the recipients of the five prizes this year. The prize in medicine has been awarded in turn during the nine years since the foundation of the Nobel prizes to von Behring, Ross, Finsen, Pawlow, Koch, Golgi and Ramon y Cajal, Laveran, Ehrlich and Metchnikoff, and, finally Kocher, thus honoring eight different countries. Germany has had three recipients; France and Russia both claim Metchnikoff.

LONDON LETTER

(From Our Regular Correspondent)

LONDON, Dec. 4, 1909.

A Historical Room at a College Museum

A special room has been added to the museum of the Royal College of Surgeons containing various exhibits of historical interest. The exhibits form a most interesting collection and include the body of a woman embalmed by Dr. Cruikshank and William Hunter in 1775; the mummified body of a boy who died from plague in 1665, which was found in the crypt of St. Botolph's Old Church; the skin of the heads of three Macas Indians from Ecuador so preserved that while contracted to the size of a doll's head they yet retain the features of living individuals; a collection of boots, shoes and gloves worn by the Irish giant O'Brien; pieces of human skin found nailed to the doors of Worcester Cathedral and the churches of Hadstock and Copford in Essex; a chain and belt used for securing lunatics; a cast of the head of Deeming, the murderer who was hanged at Newgate in 1892; and an electrical machine used by a surgeon named Birch about 1775, with a manuscript by his sister describing the cures said to have been effected with the machine.

Sleeping Sickness in Uganda

An important paper has been communicated to the Royal Society, the joint work of Col. Sir David Bruce, Capt. A. E. Hamerton, Capt. H. R. Bateman and Capt. F. P. Mackie, who constituted the sleeping sickness commission of the society recently sent to Uganda to investigate. The policy during the last two years of clearing the shores and islands of Lake Victoria of their inhabitants has been carried out. No native has been allowed to live or work within two miles of the shore except at a few cleared landing places, and within the last few months all the islands in the lake have been emptied of their population. Until recently it was believed that the tsetse fly, which conveys the disease, retains its infectivity for forty-eight hours, and therefore that it would be possible with safety to clear an island of its infected population one day and restock it with healthy natives a few days later. But it has now been found by experiment that the fly retains its infectivity up to eighty days and it seems probable that once infected a fly harbors the trypanosomes for the rest of its life. It therefore became important to discover how long the flies on the lake shore remained infective after the native population had been removed. Flies were collected at a cleared landing place which was used as a market by the inhabitants of one of the islands, who were highly infected with sleeping-sickness. This constituted a danger to the healthy natives of the mainland who had come to the market from places beyond the area of the disease. The landing was therefore cleared of undergrowth and in a short time the flies disappeared. As the result of many experiments it was concluded that the flies remained infective at least two years after the natives had been removed. This long duration of infectivity can be accounted for only by two theories—long life of the fly or the infection along the lake shore of birds and mammals which become a reservoir of the disease. At present the former theory has not been proved or disproved and of the latter there is no experimental proof.

PARIS LETTER

(From Our Regular Correspondent)

PARIS, Dec. 3, 1909.

Discussion in the Chamber of Deputies on Depopulation

Apropos of the discussion of that portion of the budget of the ministry of the interior relating to the protection of young children, M. Gauthier of Clagny called the attention of the Chamber of Deputies to the serious question of depopulation. The alarming figures on this subject for the first semester of the present year were given in THE JOURNAL (Nov. 4, 1909, liii, 1833). The Neo-Malthusian League is spreading among women the idea that they have the right to avoid maternity. Since 1887 another league, also intended to promote depopulation, has been working through pamphlets, prospectuses, journals and lectures. There is also a class of criminals who, under the shelter of the league, send to families manuals of debauchery and pornography. In closing M. Gauthier referred to President Roosevelt's epigram that a nation in which the men are unwilling to make war and the women are unwilling to bear children is a nation stricken at the heart. M. Briand, the prime minister, replied that orders had been given that the authors of these shameful works should be severely prosecuted. He believed that the existing laws were sufficient for the purpose, but if not, he should not hesitate to demand more rigorous ones.

Code for the Protection of Young Children

The prefect of police of Paris has just caused a pamphlet to be issued in which are found all the laws, ordinances, and national and municipal instructions which bear on young children. This code for the protection of childhood will be sent to all the municipalities under the jurisdiction of the Paris prefecture, to the medical inspectors, and to the visiting inspectors of children boarded out. In this code will be found all the documents in regard to the obligations imposed on wet-nurses and care-takers, local commissions and medical inspectors of crèches. To this will be added the elementary advice, on the hygiene of infancy, in regard to natural, mixed and artificial feeding, published for mothers and nurses by the Academy of Medicine. The *Oeuvre de protection des enfants du premier âge* gives inestimable service in Paris. Thanks to its incessant efforts, the mortality of children boarded out under its control in the department of the Seine has been only 4.96 per cent. during 1908, while the average of infant mortality during the same year reached the truly frightful figure of 15 per cent. One may moreover form an estimate of the progress made by this organization from the fact that in 1907 the mortality of its nurslings was 5.15 per cent. and in 1900 8.7 per cent.

Repression of the Renting of Children for Begging

It is not rare to see in the streets of Paris beggars who in order to excite the pity of passers-by, carry in their arms during all seasons and at all hours, young children, most frequently lent or rented by irresponsible parents. Believing that this exploitation of infancy affects the health of young children unfavorably, the prefect of the police has just given severe orders for the repression of the criminal practices of those who rent children. After a rapid inquiry to determine the origin of such children, the agents of the police will send the children to an asylum of the public charities (*Assistance Publique*) and moreover the unworthy parents will be prosecuted before the courts.

The Period of Rest for Pregnant and Lying-in Women

A law has just been passed guaranteeing the positions of employed women during pregnancy and lying-in. According to this law, an employer who breaks a contract of employment because of the suspension of work by a woman during the eight consecutive weeks in the period which precedes and follows child-birth is liable for damages to the woman, provided that the latter shall have warned her employer of the reason of her absence.

BERLIN LETTER

(From Our Regular Correspondent)

BERLIN, Nov. 24, 1909.

Personal

Professor v. Franqué, the gynecologist of Giessen, has refused a call to Göttingen as successor to Professor Runge, deceased.——Dr. Treutlein, privatdocent at Würzburg, who has for some years been general director of the public health department of the Republic of Bolivia, has left for political reasons and has returned to Würzburg as instructor in naval, military and tropical hygiene.——Professor Bernstein, director of the physiologic institute at Halle, will celebrate his seventieth birthday, December 8.——Professor Schirmer, head of the eye clinic at Strasburg, has resigned. This is somewhat surprising as Schirmer is only 45.

Motherhood Insurance

The plan for insurance of women about to become mothers, which has been undertaken under private auspices in Baden, has been noticed in a previous letter. The proposal to make this a government undertaking applying to the whole empire has little prospect of success as the necessary annual expense of 870,000,000 (280,000,000 marks) would be more than the government would be justified in expending in the present state of its finances. Besides it is believed that sufficient relief for women and nurslings is afforded by the recent legislation in favor of women workers and by the proposed imperial insurance law.

Alcohol and Crime

An investigation into the relations between alcoholic intoxication and crime has been ordered by the Bavarian department of justice, confined at first to cases of serious offences against the criminal law. The investigation is to begin with Jan. 1, 1910. Those cases are to be included in which the crime was committed under the influence of intoxicants, or which can be traced to the habitual use of alcohol.

Limitation of Foreign Students at Strasburg Medical Clinics

Of late years the number of foreign female auditors (*hospitantinnen*) at the clinics has increased so considerably that the native students feel themselves placed at the disadvantage by the preemption of the best places and have made complaint accordingly. It has been settled that women who are not matriculants shall be allowed in future to visit the clinics as auditors only under condition that they can show evidence of a sufficient previous education. This evidence must be furnished by the presentation of a certificate that the individual is prepared for the regular study of medicine in a university or institution of equal grade in his own country. Exceptions are to be allowed for such auditors as take only special medical lectures, but are not pursuing a regular medical course.

Change of Physican at Lahmann's Sanatorium

At the end of next year Prof. v. Düring, director of the well known Lahmann's sanatorium, "The White Stag," at Dresden, will resign his position. What reasons have induced him to give up so desirable a place are not known; probably some trouble with the proprietors has arisen, as is usual, because the medical interest has conflicted with the commercial interest of the proprietors of the sanatorium. Similar conditions are seen in other institutions, especially in Brehmer's sanatorium at Görbersdorf, which is managed by the heirs of the renowned founder of the physical-dietetic treatment of consumption. Since the death of Brehmer, the medical management of the institution is changed almost annually. That the interests of the patients must suffer with such frequent change of physicians is readily understood. Prof. v. Düring is essentially a dermatologist. In this specialty he was professor for many years at the military school at Constantinople in the service of the Turkish government and won great distinction in this position. For this reason he received the title of pasha from the former sultan. From Constantinople he was called to Kiel a few years ago as professor extraordinary of dermatology. A short time thereafter he gave up his position and after the death of Lahmann he undertook the direction of his sanatorium. His assistants also leave the institution with him.

Typhoid Bacillus Carriers

In a small epidemic of fourteen cases of typhoid fever in Westphalia it was ascertained that the germs of the disease were introduced with the milk that was furnished by a dealer in the place in whose family there was found a bacillus carrier who had probably harbored bacilli in his intestine since an attack of typhoid which he experienced nine years before. In another village of Westphalia a cook who had typhoid twenty years ago has communicated the disease in the course of time to members of the family of almost all the persons in whose service she has been and has been responsible for at least twenty-four such cases.

Pharmacology

[CONTRIBUTION FROM THE CHEMICAL LABORATORY OF THE AMERICAN MEDICAL ASSOCIATION]

BISMUTH BETA-NAPHTHOLATE

W. A. Puckner and W. S. Hilpert

Uniformity in composition of medicines, official in the U. S. Pharmacopœia, is secured by the method of preparation or the tests of purity and strength for which that book provides. As a rule there are no standards of purity or strength for substances that are not included in the Pharmacopœia, with the result that substances nominally supposed to be identical frequently are found to vary in composition not only with the brand, but often with different batches of the same brand. The Council on Pharmacy and Chemistry aims to establish standards for these articles, so as to insure the uniformity of unofficial remedies and to overcome this stumbling block to therapeutic accuracy and efficiency. It is in connection with this line of work that the examinations of different brands of bismuth beta-naphtholate, about to be described, were made. The results are published for the specific purpose of showing the need of such control of unofficial articles.

One of the incidental results of these examinations is to show that even different specimens of what is supposed to be the same product, may differ widely in composition. It is especially interesting in this particular case, because the firm whose product is shown to have possessed such lack of uniformity is the one that holds patents which are claimed to give it the exclusive right to make this product. It sells the preparation under a protected (trade-marked) name, and curiously enough it maintained that other preparations of bismuth beta-naphtholate which appeared on the market shortly after this protected preparation was introduced were "crude toxic and irritant imitations which are mere mechanical mixtures of bismuth salts and naphthol."

THE DRUG ITSELF

Bismuth beta-naphtholate is practically insoluble in water and is only slightly soluble in dilute acids. It is, therefore, not materially changed in the stomach. The intestinal fluids, however, are said to decompose it into its constituents and according to the literature on the subject when thus acted on the bismuth exerts an astringent action, while the naphthol acts as an antiseptic. The composition of bismuth beta-naptholate has not been definitely determined; the following chemical formulas are variously assigned to it: $C_{10}H_7O(BiO)$ (Schmidt's Pharm. Chemie.); $Bi_2O_2(OH)C_{10}H_7O$ (National Dispensatory; Merck's Index; British Codex; Chemische Fabrik

von Heyden; Hager's Handbuch der Pharm. Praxis); and $Bi(C_{10}H_7O)_3.3H_2O$ (U. S. Dispensatory).

The composition of bismuth salts varies so that it is probable that a bismuth beta-naphtholate of definite composition can only be made with great difficulty. However, since the therapeutic value of this preparation must depend on the bismuth and on the "combined naphthol" contents, it is important that the substance used by physicians should be of fairly uniform composition. Its therapeutic value is said to depend largely on its freedom from uncombined or free naphthol and the product should, therefore, be relatively free from this constituent. With the object of determining the uniformity of composition of bismuth beta-naphtholate, as it is now available, the various products found on the market were analyzed, to determine their bismuth and free and "combined naphthol" contents.

LABORATORY FINDINGS

Bismuth beta-naphtholate is found on the market in powder and in tablet form. The powder is light-brown or grayish-brown, without odor and practically tasteless, insoluble in water and only partially so in alcohol. Strong acids decompose it into its components which by proper manipulation can be separated and estimated.

Several specimens, both of tablets and powder, of different brands were obtained, some from the manufacturers and others on the open market. In appearance the tablets were practically alike, but the powder form varied from a light grayish color through a pinkish-brown to dark brown. Experiments were made to determine the bismuth and combined naphthol contents by decomposing the bismuth beta-naphtholate and separating the constituents. Since bismuth beta-naphtholate is insoluble in chloroform, substances other than bismuth beta-naphtholate, including free naphthol were estimated by direct extraction of the specimens with chloroform or ether. The results of these estimations[1] are given in the following table:

Brand.	Bismuth.	"Total Naphthol."	Sol. in Chloroform or Ether.
Orphol (Chemische Fabrik von Heyden).			
Specimen 1 (tablets)*	67.12	10.57	3.85
Specimen 2 (tablets)	61.05	21.58	0.40
Specimen 3 (powder)	69.08	21.50	18.46
Specimen 4 (powder)	68.21	24.05	0.40
Bismuth Beta-Naphtholate (H. K. Mulford Co.).			
Specimen 1 (tablets)	56.47	6.89	4.89
Specimen 2 (tablets)	51.27	18.84	3.21
Bismuth Beta-Naphtholate (Powers-Weightman-Rosengarten Co.)			
Specimen 1 (powder)	75.30	15.56	0.19
Specimen 2 (powder)	75.07	15.56	0.33

* The percentages given were calculated on the assumption that the tablets contained the amount of substance claimed.

A noticeable lack of uniformity among the products is disclosed by the table. Thus the bismuth content ranges from 51.27 per cent. in a specimen of one brand to 75.30 per cent. in another brand. This alone certainly shows the necessity of some control and regulation in the manufacture of the products. Among the specimens of a single brand we find the bismuth varying from 61.05 to 69.08 per cent., a condition which should not exist and which by care in preparation can be avoided.

A similar variation exists in the naphthol content which ranged from 6.89 to 21.58 per cent. It was found that the specimens varied not only in the quantity of actual naphthol present but also in the composition of what was supposed to be naphthol. The material which was extracted weighed and recorded as "total" or "combined naphthol" should represent the content of beta-naphthol. Some specimens examined failed to respond to the usual tests for beta-naphthol. The same may be said of the so-called "free naphthol," or more correctly, "ether- and chloroform-soluble matter." As indicated by the solubility in chloroform or in ether the various products were found to contain from 0.19 per cent. to about 18.46 per cent. soluble matter.

It is noteworthy that the products of the same brand, manufactured under the same patent, bearing the same trade-marked name on identical labels—should vary from 61 to 69 per cent. in the bismuth content, from 11 to 24 per cent. in naphthol content, and from 0.40 to 18.0 per cent. in matter soluble in chloroform. If such a condition exists in a product so identified and protected what may not be expected of products for which no claims of uniformity are made or implied, by patents or trademarks? As a means of comparison of the compositions of the different brands examined the following summary is given:

SUMMARY OF FINDINGS

BISMUTH BETA-NAPHTHOLATE (POWERS-WEIGHTMAN-ROSENGARTEN CO.).—The most important features shown by the analysis of this product are high bismuth content and practical freedom from free naphthol. The two specimens of this brand examined—one purchased on the open market and the other submitted by the company — were found to be almost identical, as is shown by the table. Specimen 1 contained 75.30 per cent. bismuth, 15.56 per cent. naphthol, and 0.19 per cent. free naphthol; specimen 2 contained 75.07 per cent. bismuth, 15.56 per cent. naphthol, and 0.33 per cent. free naphthol. This brand contained the highest percentage of bismuth and the lowest content of free naphthol of any examined.

ORPHOL (CHEMISCHE FABRIK VON HEYDEN).—The specimens of Orphol examined may well be specified as "old" and "new" Orphol. The "old" specimens were obtained and analyzed some time ago, while the "new" specimens were obtained only recently. Among the old specimens, that is those received and examined some time ago, the bismuth content averaged about 68 per cent., the matter recorded as "total naphthol" about 16 per cent., and the chloroform-soluble matter about 11 per cent., the highest content of the latter found in any brand. The so-called naphthol of these old specimens in many cases failed to respond to the usual tests for naphthol, and exhibited none of the physical properties of naphthol, so that it was concluded that the greater part of the naphthol used in the preparation of the product had in some way, by oxidation or nitration probably been converted into decomposition products, and so no longer gave naphthol reactions. In other words, naphthol, as such, was not present in the preparation.

The chloroform-soluble material consisted of not free naphthol but was chiefly a bismuth organic compound, which also gave none of the free naphthol reactions. This constituent was found in quantities as high as 18 per cent., and just to that extent the product was contaminated and made uncertain.

These specimens, considering their composition, could hardly be called bismuth beta-naphtholate in spite of the patent rights and trade-marked name, and they stand out as an example of the kind of product that may be expected while no control in the manufacture is demanded. A specimen of Orphol tablets examined some time ago was found to contain 67.12 per cent. bismuth, 10.57 per cent. "naphthol," and 3.85 per cent. chloroform soluble matter. A specimen examined more recently contained about 61 per cent. bismuth, 21.6 per cent. naphthol, and from 0.3 to 0.4 per cent. chloroform soluble matter. Although the new tablets show a somewhat diminished bismuth content, the naphthol has been materially increased and free naphthol practically eliminated, showing on the whole an improvement over the older tablets.

The most recent specimen of Orphol examined contains 68.21 per cent. bismuth, 24.05 per cent. naphthol, and 0.40 per cent. chloroform soluble matter. A comparison of this analysis with estimations made on specimens some time ago indicates the extent to which the product has been improved. The combined naphthol, which is important for the proper therapeutic action of the product is well above the average and the free naphthol which is a very objectionable ingredient is now almost entirely eliminated, to the benefit of the profession and the credit of the manufacturers.

BISMUTH BETA-NAPHTHOLATE TABLETS. (H. K. MULFORD CO.).—A specimen of these tablets was examined some time ago and the bismuth beta-naphtholate was found to contain 56.47 per cent. bismuth, 6.89 per cent. naphthol, and 4.89 per cent. chloroform soluble matter. A more recent product was examined and found to contain 51.27 per cent. bismuth, 18.84 per cent. combined naphthol and 3.21 per cent. chloroform

1. The analytical details are contained in a paper presented to the scientific section of the American Pharmaceutical Association, 1909, and will appear in the printed proceedings of that body and also in the Annual Report of the Laboratory of the American Medical Association.

soluble matter. Here again attention is called to the endeavor and partial success in the improvement of the product. Although the new tablets have a slightly lower bismuth content, the total naphthol has been appreciably increased, while a certain amount of the undesirable free naphthol has been eliminated.

A STANDARD NEEDED AND RECOMMENDED

The above summary of the results of analysis for the various products and specimens brings out more distinctly the necessity of a standard for the control of the future manufacture of bismuth beta-naphtholate, insuring a product on which physicians can rely for uniform effects.

To establish a standard for bismuth beta-naphtholate, both the highest possible and the highest available purity must be considered. It would be useless to set a standard which could not be conformed to and yet one must be chosen which will eliminate the poorer and more variable products. For bismuth beta-naphtholate the following standard is recommended:

Bismuth beta-naphtholate should contain not less than 60 per cent. bismuth, 15 per cent. total naphthol, which should respond to tests for beta-naphthol, nor more than 1 per cent. of ether- or chloroform-soluble matter, when analyzed according to the methods of analysis employed in this investigation.

PHARMACOPEIAL REVISION

Report of the Therapeutic Committee of the British Medical Association

The report of the therapeutic committee of the British Medical Association on the revision of the British Pharmacopeia (supplement to the *British Medical Journal*, 1908, ii, 319) is of interest to American physicians because it clearly indicates that on the question of scope or content of the Pharmacopeia, the one question that is of prime importance to the physician, medical men are not only capable of outlining rational general principles but are also able to give, in detail, reasons that will appeal to thinking men, quite regardless of whether the latter have any special knowledge of medicines.

The general principles adopted by the committee on therapeutics to guide them in determining on the proposed additions and deletions are as follows:

"1. Crude drugs which contain an active ingredient possessing all the desirable actions of the crude drug might be replaced by this active ingredient if it can be obtained commercially and its identification and purity ensured. If such an active principle is official, the crude drug might be deleted. For example, jaborandi leaves, coca leaves, elaterium and many crude drugs yielding only volatile oils might be deleted.

"2. Drugs and their preparations possessing no obvious and serviceable action should be deleted, e. g., arnica rhizome, cuspari bark, hemidesmus root, lupulin, mezereon bark, serpentary rhizome.

"3. Unnecessary duplication of the preparations of a drug should be avoided. Thus one 1 per cent. solution of a morphine salt, or one solid extract of belladonna, is sufficient.

"4. Purely diluent preparations of a drug should, as far as possible, be avoided, e. g., solutions of potassium permanganate, almond mixture.

"5. Substances which do not require to be defined officially for the protection of the practitioner, or the vendor or purchaser, e. g., prunes, figs, brandy, sherry, might be omitted.

"6. Substances of no therapeutic importance, which are used only in the making of preparations and are not contained in the final products, should be deleted or transferred to an appendix, e. g., benzol, solution of iron persulphate."

These principles show very clearly that the therapeutic committee of the British Medical Association has in view a pharmacopeia intended to serve the best interests of members of our profession, an aim that should be self-evident but one which is commonly overlooked in considering what the Pharmacopeia should be.

These principles also indicate that the problems that are confronting British physicians are in no way different from those that we must contend with in the revision of our Pharmacopeia; and they further suggest that if the real purposes of the Pharmacopeia could be kept steadfastly in mind the problems of its revision would be enormously simplified.

While the therapeutic committee of the British Medical Association does not specifically state that the true therapeutic value of a substance should be the sole criterion for admission, the principles as stated show the trend of opinion. In curious contrast to this evidenced thought is the sentiment, altogether too freely adopted in our own country, that the extent of use of a substance be considered as the sole justification for admission to or retention in the Pharmacopeia. Unfortunately the degree of popularity which a preparation enjoys frequently stands in no relation to its real value or even to its reputation among the leading clinical authorities, at least so far as this country is concerned.

The *British Medical Journal*, commenting editorially on the report of the therapeutic committee, points out that, while several recommendations for the omission of drugs from the future editions of the British Pharmacopeia may seem somewhat drastic, they are nevertheless fully justified by the general principles adopted as a guide for the committee.

Altogether the suggested deletions number about one hundred and include many articles and preparations which in former times were very familiar, but which in the light of more accurate knowledge and greater experience are known to be unnecessary or valueless. Other articles like prunes, figs and brandy are recommended for omission because they are not usually prescribed as such and require no official descriptions, being commercial products that vary in quality and price. Altogether it is quite apparent that the therapeutic committee has given much thought to the work. The report should be read by all who are directly interested in the question of pharmacopeial revision.

A perusal of the list of articles recommended for admission is to the advantage of our own Pharmacopeia, since most of these articles are now official in the U. S. Pharmacopeia. The proposed admissions include: extract of malt, ethyl chlorid, methyl salicylate, guaiacol, solution of formaldehyd, chloralamid, hexamethylenamin, solution of cresol and soap, and antidiphtheric serum; also the following unofficial articles: aspirin, or acetyl salicylic acid, a suprarenal preparation, veronal, a soluble preparation of theobromin, orthoform, a less toxic substitute for cocain, and some articles of minor importance.

We in this country have made at least a good beginning in connection with the coming revision of our Pharmacopeia, as is shown by the reports of the several section committees (THE JOURNAL A. M. A., Sept. 4, 1909, p. 791). In an editorial (Oct. 30, 1909, p. 1491) we stated that the methods pursued concerning admissions by the last committee on revision were not such as to appeal to the medical profession, too little pains having been taken to determine how well founded were the wishes represented as favoring admissions. It will be well, therefore, to see that in the forthcoming revision of the Pharmacopeia such methods are followed as will secure a representation of the practices of progressive medical men.

With the report of the therapeutic committee of the British Medical Association as an illustration of the practical possibilities, with the reports of the section committees of the American Medical Association as a demonstration of the feasibility of doing even more efficient work, and with the admirable scheme for revision suggested by Torald Sollmann (THE JOURNAL, Nov. 6, 1909, p. 1543) as a practicable solution of pharmacopeial revision problems to look forward to, it would appear as though the way for securing a better and more representative book for the medical practitioner was clearly outlined. It remains for members of the medical profession to say whether they will have a Pharmacopeia representing the foremost thought in therapeutics, or one which is practically valueless for this purpose.

As medical men we must not lose sight of the fact that the shortcomings of the Pharmacopeia, so far as scope and content are concerned, are in reality a measure of our own neglect of a plain duty, and that unless all classes of medical practitioners are willing to take an active interest in the matter of pharmacopeial revision it will be difficult indeed to avoid the odium that must attach itself to us should the forthcoming ninth edition of the U. S. Pharmacopeia fail to reflect adequately the best, and only the best pharmacal therapy in American medicine.

COLLARGOL

Report of the Council on Pharmacy and Chemistry

The following recommendation was submitted to the Council:

A letter from Dr. S. Solis Cohen to the Editor of THE JOURNAL has been transmitted to the Council. In this letter Dr. Cohen states that his communication to the chairman of the collargol commission should have been published with the Council's rejoinder to Schering & Glatz's reply, which appeared in THE JOURNAL, July 10, 1909. In view of Dr. Cohen's request, it is recommended that publication of his letter of dissent to the majority's findings be authorized.

The recommendation having been adopted, the letter of Dr. S. Solis Cohen is here published.

W. A. PUCKNER, Secretary.

PHILADELPHIA, May 3, 1909.

DR. W. A. PUCKNER, Chicago, Ill.

My Dear Dr. Puckner:—I have received your letter of April 30, enclosing copy of Schering & Glatz's report and of Dr. Edsall's explanatory note.

I still feel that the committee made a mistake in not permitting Messrs. Schering & Glatz to be heard before deciding on a report, although this error was in a measure corrected by submitting to them the proposed report and receiving their written comment on it before publication.

The explanatory note involves reaffirmation of a number of points of fact, theory and attitude concerning which I differed with the majority of the committee, and I am therefore unable to give it my unreserved approval. As an instance of what I believe to be hypercriticism on the part of the committee, I would cite that portion of the explanatory note relating to the Hocheisen quotation. The fact remains that Hocheisen used the word "wertvolles," and Schering & Glatz admit that they should have translated it "valuable" instead of "invaluable." The committee shows that what Hocheisen really said was: "Hence collargol is no specific, but is an aid in suitable cases," and that further on, after having described types of unsuitable cases, he adds: "Used according to these principles, collargol injections constitute a valuable measure in cases of puerperal sepsis." Messrs. Schering & Glatz now condense this into: "Collargol is a valuable aid in cases of puerperal sepsis."

It seems to me that both Messrs. Schering & Glatz and the committee are in part at fault. That is to say, Messrs. Schering & Glatz should quote exactly what an author says, with his limitations and in his exact language. They are not justified in leaving out the limiting phrase, "Used according to these principles;" they are not justified in leaving out the limiting phrase, "no specific." On the other hand, it must be admitted that the opinion of the author in this particular instance has been substantially represented in the revised phrase, and that to magnify the importance of the incident is to leave the judicial attitude and approach that of the prosecutor.

My own opinion remains as before, that Messrs. Schering & Glatz claim too much, and that the majority of the committee doubts too much; that collargol is worthy of admittance to the list of recognized nonofficial remedies, and that Messrs. Schering & Glatz should be required to revise their advertising matter in such a way as to give the exact words of every author cited; and that all the limitations and qualifications which an author throws around his opinion should be quoted. On the other hand, they are perfectly justified in quoting experiments and conclusions, clinical observations and recommendations, of investigators and of clinicians who may have formed a favorable opinion concerning the drug or who may have established to their own satisfaction any chemical, clinical or pharmacologic fact concerning it. The evidence being submitted, the reader can draw his own conclusions as to its trustworthiness and authority. It would be manifestly unfair to set up for advertising matter a standard which is not required of text-books, namely, infallibility in observation and logic.

To avoid misunderstanding, however, I would, in conclusion, emphasize again my agreement with the majority of the committee that quotations must be exact, *verbatim et literatim*, and that statements of the results of experimental observations must be made in such a way as to convey the exact facts, and not in so partial a manner that, however innocently, they may mislead readers not familiar with the details of laboratory work.

It is time to stop bandying words in this matter, and come to an agreement and conclusion honorable to all concerned and worthy of the issue. SOLOMON SOLIS COHEN.

Correspondence

Transmission of Bovine Tuberculosis to Human Beings

To the Editor:—It behooves one who writes history to be very sure of his facts. When one attempts to correct history already written, the necessity for accuracy is still more important. These thoughts have been forced on me through the reading of the article by Dr. H. L. K. Shaw in THE JOURNAL for Nov. 27, 1909, on the "Transmission of Bovine Tuberculosis to Children." It has seldom been my misfortune to read a so-called scientific paper with such glaring inaccuracies of statement. Dr. Shaw is evidently very anxious to support Koch in his errors through thick and thin, and evinces an ardor which would be better served by greater accuracy.

To begin with, the conclusions he attributes to Koch at the British Congress for Tuberculosis in 1901 are those given by him in 1908 in Washington, after Koch's errors had been shown up by the work of numerous scientists in various parts of the world. Dr. Shaw complains that Koch has been persistently misquoted, but he seems to have fallen into the bad habit himself. What Koch really said in London in 1901 is as follows:

1. "Human tuberculosis differs from bovine and cannot be transmitted to cattle."

2. "Though the important question whether man is susceptible to bovine tuberculosis at all is not yet absolutely decided, and will not admit of absolute decision to-day or to-morrow, one is, nevertheless, already at liberty to say that if such a susceptibility really exists the infection of human beings is but a very rare occurrence. I should estimate the extent of infection by the milk and flesh of tuberculous cattle, and the butter made of this milk, is hardly greater than that of hereditary transmission, and, therefore, do not deem it advisable to take any measures against it."

No one can read these conclusions without believing that Koch intended to make the practical statement that there was no danger to mankind from tuberculosis of cattle, and very properly this impression has become wide-spread with the laity and the profession.

Koch's conclusions in 1908 are as follows:

1. "The tubercle bacilli of bovine tuberculosis are different from those of human tuberculosis."

2. "Human beings may be infected by bovine tubercle bacilli, but serious diseases from this cause occur very rarely."

3. "Preventive measures against tuberculosis should therefore be directed primarily against the propagation of human tubercle bacilli."

As Dr. Shaw seems to be ignorant of what Koch said in 1901, it is not to be expected that he would appreciate the difference betwen Koch's attitude at that time and at present. In 1901 Koch questioned the possibility of transmission of bovine tuberculosis to man in any form; in 1908 he limited his contention to pulmonary consumption (THE JOURNAL A. M. A., Conference in Camera on Human and Bovine Tuberculosis, Oct. 10, 1908, p. 1262). The stand now taken is entirely different from the former, and Koch has skilfully raised an academic discussion which has befogged the main question, and diverted the attention of some persons from his former blunder.

At the so-called "conference in camera," to which Dr. Shaw refers, there were not many present who could report cases of pulmonary tuberculosis due to the bovine bacillus. It must be remembered, however, that this point had never before been raised, and the great majority of those who had studied the question were interested solely in refuting Koch's statement regarding the problematical danger to mankind from tuberculosis of cattle. It is easy to say offhand, as Dr. Shaw does, that "the possibility of contamination had not been fully guarded against" by the English Royal Commission and by Professor Arloing, but this does not prove it. Koch's contention in this case was mere quibbling. It must be remembered also that the German commission in its first report gives one instance of miliary tuberculosis in which the bovine bacillus was found in the lung. Koch declined to accept this

case as one of pulmonary tuberculosis due to bovine bacillus, and Dr. Theobald Smith in his attempts to support Koch, found it necessary to explain that these were not cases of pulmonary consumption, because the patient died before open lesions could form. The difference between ordinary pulmonary consumption and miliary tuberculosis is of course known to every medical student, but certainly this case reported by the German commission should be ranked among those of pulmonary tuberculosis due to the bovine bacillus.

Dr. Shaw also makes the statement that, in 1905, I asserted "that the majority of cases of tuberculosis of children were of alimentary origin and due to the bovine bacillus." Again Dr. Shaw is guilty of misquotation. I have never in public or private, in writing or by spoken word made such a statement, nor have I believed it. It may be cruel to ask that Dr. Shaw will read carefully what I have written on this subject, but I certainly have the right to ask this when he professes to quote me.

Dr. Shaw refers to the case of an infant in which, he says, a long chain of circumstantial evidence convicted a cow of being the origin of the disease. When the cow was slaughtered, however, no tuberculosis could be found. It is not strange that the cow did not transmit tuberculosis to this child since it was free of the disease itself. It is hard to understand just what Dr. Shaw wishes to show by this case. Only two conclusions are justified. First, the test may have been at fault; but, second, and more important still, it points to the unreliability of clinical evidence in determining this question.

Dr. Shaw speaks further of a circular letter sent out to members of the American Pediatric Society and leading pathologists. I wish to protest here against any such method of deciding this question. Without wishing to belittle the ability of any of these men, I hold that the question is one that can be determined only by accurate laboratory investigation. Only pathologists and bacteriologists who have made a careful study of this question are competent to express an opinion on it. I grant to every one, of course, the right to read and draw conclusions as to the weight of evidence on one side or the other. Laboratory investigations have shown beyond question that bovine tuberculosis is transmissible to human beings, and that the lesions produced do not differ in any way from those caused by the human bacillus.

Dr. Shaw speaks of the sensational articles "magnifying the great danger of bovine tuberculosis," and quotes Dr. Bensel as deprecating "the spread of alarm in the minds of the public in regard to the danger of tuberculosis from milk." If Dr. Bensel has made any investigations which render him competent to express such an opinion, they have escaped my observation. It may be injurious to have the public believe that milk is the chief cause of tuberculosis in human beings, but when the work of Dr. Park in the city of New York shows that 200, and possibly 300 children die from bovine tuberculosis every year in that city, it seems high time that the profession and public in general should recognize bovine tuberculosis as a serious menace to human health.

Dr. Shaw, while trying to belittle the results of the English Royal Commission, failed to quote the work of the German Imperial Commission, which in fairness he should have given. This commission in 84 cases of tuberculosis in children found that 21, or exactly 25 per cent., showed the bovine type of bacillus, figures which correspond very closely to those given by the English commission.

I would not be understood as belittling the importance of all measures of prevention. I admit freely, as I always have, that as far as our present evidence goes, man is the greatest source of danger to man. I have not, as Dr. Shaw intimates, changed my position on this one particle. Those who are actively engaged in supporting Koch in his blunders, and trying to belittle the importance of bovine tuberculosis as a menace to human health, are, it seems to me, criminally responsible.

I have felt the necessity of speaking plainly in writing this letter, because in the recent and most important suit against the city of Milwaukee brought to prevent the enforcement of its ordinance in regard to bovine tuberculosis, Dr. Shaw's testimony has been made much of by the plaintiffs. I think I have shown that he has misquoted liberally, and if his conclusions have been drawn from such careless reading, they must of course be of no value.

MAZYCK P. RAVENEL, Madison, Wis.

The preceding letter was submitted to Dr. Shaw, who replies as follows:

To the Editor:—Permit me to thank you for this opportunity of replying to Dr. Ravenel's rather bitter attack on my scientific integrity. The main criticism is that I have been inaccurate in the presentation of my quotations. Although I made use of over thirty references Dr. Ravenel challenges but two. The first is that I endeavored to mislead my readers in the matter of Koch's conclusions before the British Congress of Tuberculosis in 1901. My authority and quotation are taken from Professor Koch's address before a joint meeting of Sections I and VII of the International Congress on Tuberculosis last fall and published in full in THE JOURNAL, Oct. 10, 1908, p. 1256. At the beginning of the address Koch states: "The results of these experiments have led me to the conclusions which I first communicated to the British Congress of Tuberculosis in 1901. They are, in substance, as follows: 1. The tubercle bacilli of bovine tuberculosis are different from those of human tuberculosis. 2. Human beings may be infected by bovine tubercle bacilli but serious diseases from this cause occur very rarely. 3. Preventive measures against tuberculosis should therefore be directed primarily against the propagation of human tubercle bacilli." While these conclusions appear in the 1908 address, yet Koch himself distinctly says they were his 1901 conclusions and that he had not changed from them in 1908.

The second accusation of misquotation is in regard to a statement attributed to Dr. Ravenel himself. If Dr. Ravenel has been misquoted and misrepresented, I offer my sincere apology. My quotation was made honestly and taken in good faith from the sworn and personally corrected testimony of Professor Adami of Montreal in certiorari proceedings in a suit between the Board of Health of Montclair, N. J., and the Borden Condensed Milk Co. This testimony is a matter of public record and accessible to Dr. Ravenel.

As I have been accused of careless and dishonest reading, I would like to call attention to just one statement in Dr. Ravenel's letter. He quotes me as saying that "it is easy to say the possibility of contamination had not been fully guarded against by the English Royal Commission and by Professor Arloing." If the reader will refer to my article on page 1807 he will find no such statement regarding the English Commission. The criticism in regard to Professor Arloing's case was not made "offhand" by me, but by Koch and Theobald Smith. (See THE JOURNAL, Oct. 10, 1908, p. 1263.)

The value of everything in this world lies in its true perspective. We must look at the facts in a calm, judicial and temperate manner. It is unfortunate that any bitterness or partisanship should be shown in seeking for the exact truth in a subject so vital to mankind. I, as a medical practitioner, have had my attention called almost exclusively to the medical side of the question; while Dr. Ravenel, in his laboratory work, has probably given almost his entire attention to bovine infection. It is the old story of the shield. I see the gold side while Dr. Ravenel has seen only the silver side. Human infection causes 98.5 per cent. of fatal tuberculosis and bovine tuberculosis causes 1.5 per cent. I have never denied that tuberculous cattle are a menace to public health. I do maintain and insist, however, that we must not in any way minimize the very great and real danger of human contagion and magnify too much the relatively unimportant danger of infection from bovine tuberculosis.

The possible motive of Dr. Ravenel lies both in the concluding paragraph of his letter and in the final paragraph of an address delivered before the American Association of Medical Milk Commissions in Chicago in 1908, which I quote, as follows: "Our statements must be definite and strong. We have the most abundant scientific evidence on which to take our stand, and there will always be those who from one motive or another try to belittle the importance of this question. Such people should not be handled too gently."

HENRY L. K. SHAW, Albany, N. Y.

Miscellany

Impressions of America.—N. Guleke, privat-docent of surgery at Strasburg, was given a traveling scholarship last spring and spent nearly three months in the United States studying the work and equipment of various surgeons, part of his report appearing in the *Münchener med. Wochenschrift* during November. He concludes with the statement that the old saying of the Americans: "We have the big buildings, but over in Germany you have the big men," has ceased to be true. America is producing such big men that the stream of disciples no longer sets exclusively toward Europe; there is a counter-stream which is bound to increase year by year, and the more active the interchange the more rapid the progress all around. He expresses amazement at the luxury of some of the hospitals, but missed in some of them the special room for changing the dressings, which is regarded as indispensable in German hospitals. The American trained nurse is lauded. The almost constant good results with ether in the hands of the Americans explains, he says, why new methods of anesthesia do not take in this country as in Europe. Guleke also expresses surprise at the slowness with which the American surgeons operate, their aim evidently being to refrain from everything that might injure or lower the vitality of any of the tissues in the slightest degree beyond what is absolutely necessary—especially their minutely painstaking measures for hemostasis. He was impressed also with the smallness of the incisions and the lack of retractors used during operations. He comments on the prompt decision for operation which permits surgical interference during the early stages of gastric ulcer or gall-stone disease when in Europe the case would still be for some time longer in the hands of the internists. He also remarks on the comparative disregard of the present status, attention being directed mainly to the anamnesis. In his description of the various operations he witnessed by Crile, Cushing, Meyer, Robinson, Ochsner, Elsberg, the Mayos, and others, he repeatedly emphasizes the perfection of the technic and asepsis. He says of the Atlantic City meeting of the A. M. A., which he attended, that it sems to correspond in every respect to the German *Naturforscher* congresses. The zeal with which the members sat through the entire sessions without signs of fatigue also impressed him; it was so contrary to the custom in the German surgical congresses where members get up and leave during an address. The courtesy in the discussions, etc., also impressed him, and the hearty applause for especially noted members.

A Note on the Faradic Stimulation of the Postcentral Gyrus in Conscious Patients.—The recent work of Sherrington and Grünbaum in accurately delineating the confines of the so-called motor area in the ape by a method of unipolar faradization have greatly revised our idea of cortical localization and led to a confirmation of the results for man by similar stimulation of the cerebral cortex in anesthetized patients. A further unique step, however, has been taken by Harvey Cushing (*Brain*, 1909, xxxii, 44) when he stimulated the postcentral gyrus of the cerebral cortex of two patients in a conscious state, during a "second-stage" operation. The two patients were "afflicted with epileptic attacks inaugurated in each instance by a sensory aura in the right hand." Primary anesthesia and ⅛ gr. of morphin were administered only for the scalp incision and to remove the bone flap. In each case "the patient composedly and promptly recovered from the temporary narcotic effect of the drug," and no pain was experienced during the remainder of the operation. The patients eagerly assisted in the experiments of cortical localization and responded, telling the sensation felt on stimulation of the cerebral cortex. The purpose of the paper is "to record solely the physiologic aspects of these observations, although their surgical aspects are possibly of even greater importance; for if it will be possible in the future to pick out with an electrode areas of the brain from which the sensory aura of a focal convulsion has originated, we shall have advanced a long way toward the possible operative localization of subcortical irritative lesions of the immediate postcentral field. . . . In both of the patients the situation of the central fissure was determined by obtaining characteristic motor responses from the precentral gyrus, these motor responses being attended by no sensation other than that of the forced change of position which accompanies similar movements elicited by stimulation of a peripheral nerve. On the other hand, in both of these patients stimulation of the postcentral convolution gave definite sensory impressions which were likened in one case to a sensation of numbness, and in the other to definite tactual impulses. In both of the patients, furthermore, stimulation of the outlying convolutions gave no response whatever, either of a subjective sensation or of active movement."

The Occurrence of Remissions and Recovery in Tuberculous Meningitis.—There exists among the majority of the medical profession the greatest skepticism with regard to the diagnosis of cases of tuberculous meningitis in which there were remissions of symptoms or in which recovery occurred. Alfred E. Martin (*Brain*, 1909, part 126, xxxii, 209,) made a careful analysis of the reports of the London and Vienna hospitals, which show that in 2,166 cases diagnosed as tuberculous meningitis, only 22 patients, or about 1 per cent., were discharged from the hospital cured or relieved, though these figures, Martin says, are perhaps a little too high. A critical review of the literature is also given, and many of the reported cases of remission and of recovery are considered doubtful. Some space is devoted to differential diagnosis and to "methods of confirming the diagnosis," in which are emphasized, that it is impossible to accept a diagnosis of tuberculous meningitis as certain if it is based solely on the clinical symptoms, though the possibility may be very great; and the importance of the complete lumbar puncture method of diagnosis. One of Martin's conclusions is that "undoubtedly long remissions and even recoveries do occur in tuberculous meningitis. Recoveries are possibly more frequent than has been believed, since no fewer than twenty undoubted cases have been recorded since 1894, while other cases of recovery have been published in which the same definite proof of the nature of the disease has not been afforded, but some of which probably were true cases of tuberculous meningitis. In these cases either the resistance of the individual is so much greater than usual that the disease is checked early in its course, or the virulence of the bacilli is so much less than usual that the lesions in the meninges become localized and later undergo a fibrous change. The lesions in the meninges may at a later period form the focus of a fresh infection, which usually terminates fatally, and consequently the prognosis in these cases must be guarded. No treatment up to the present has been discovered which has any specific effect in promoting the favorable termination of the disease."

Poisoning from Illuminating Gas.—A. Robin's advice is to keep the patient seated instead of reclining, thus reducing the congestion in the head, sprinkle with cold water, and rub the legs vigorously while keeping up artificial respiration; possibly traction of the tongue (Laborde) will be sufficient. Venesection should be done as promptly as possible, withdrawing about 500 gm., nearly 15 ounces, of blood. As soon as this has been done, apply cupping to the base of the lungs, front and rear, at the side and at the back of the neck. The patient should then be made to inhale oxygen; "he can never be given enough, nor can it be kept up long enough." A purgative enema should then be given, possibly 15 gm. each of sodium sulphate and senna in 500 gm. water. In one case in which all these measures failed, he finally succeeded by intravenous infusion of 500 gm. of physiologic salt solution. The neuralgias which are liable to develop later should not be treated with the usual drugs as the latter have a more or less toxic action on the red corpuscles; morphin should be the main reliance. Any paralysis developing should be combated with electricity and massage, anemia with sulphur baths and iron. His article is summarized in the *Gazette Méd. Belge*, 1909, xxii, 79.

The Influence of Hot Baths on Pulse Frequency, Blood-Pressure, Body Temperature, Breathing Volume and Alveolar Tension in Man.—The physiologic effects of hot and cold baths on the normal, healthy human individual were demonstrated by Leonard Hill and Martin Flack (*Jour. Physiol.*, 1909, xxxviii, 441). The tabulated results afford a ready reference of the principal physiologic effects of hot and cold baths.

Such results should be taken into account in the consideration of the indication or contraindication of hot or cold baths in clinical cases. It is shown "that immersion up to the neck in a hot bath (110-105 F.) raises the mouth, axilla and rectal temperature up to 102.5-104.6 F. in fifteen or thiry minutes. This rise of temperature is accompanied by greatly increased pulse frequency (up to 160), and lowered blood-pressure (down to 60), and loss of the mechanism which compensates for the influence of gravity on the circulation. The rise of body temperature is also accompanied in every case but one by greatly increased breathing frequency and volume (even up to 50 liters), accompanied by a notable fall of carbon dioxid tension (down to 3.07), and corresponding rise in oxygen tension of the alveolar air. Owing to the washing-out effect of and increased oxygenation produced by this heat dyspnea, a student is able to hold his breath after a hot bath two and a half times as long as normally. A cold shower constricts the skin and lowers the axillary and mouth temperatures to normal or subnormal, but not the rectal temperature; it lowers the pulse frequency, increases its fulness, raises the blood-pressure and stops the faintness. The breathing volume and alveolar tensions return to normal after the shower."

A Constant Bursa in Relation with the Bundle of His.—E. J. Curran (*Anatomischer Anzeiger*, Sept. 1, 1909, xxxv, 89) from a study of human, calves' and sheeps' hearts points out the following new facts and considerations concerning the auriculoventricular bundle of His. There is a bursa of lubricating mechanism in constant relation with the auriculoventricular bundle, in view of which the possibility of bursitis must be considered in connection with certain cardiac symptoms, and with conditions met with in acute febrile diseases, such as acute rheumatism, endocarditis, etc. The bursa is capable of facilitating the extension of any endocardial process along the course of the conducting system, on account of its anatomical relationship with the endocardium, and of the fact that even small twigs of the auriculoventricular bundle which lie immediately under the endocardium are surrounded with cellular tissue, the spaces of which are continuous with the main bursa. The existence of the bursa tends to prove either that the auriculoventricular bundle does not contract at all, or that it contracts in a different way and at a different time from the contraction of the ventricle. The striking gross resemblance of the reticulum in the calves' and sheep's hearts to a nerve ganglion, and its connection with all parts of both auricles through three large trunks and a number of small twigs and not, as was once thought, merely arising in the right auricle only, is very evident when it is carefully dissected out. These connections point to the possibility of the contraction wave either beginning in the reticulum and proceeding through its branches to all parts of both auricles, or to its coming from all parts of both auricles to meet at the reticulum. In this case there would be a probability of each auricle controlling the time of contraction of the corresponding ventricle, and the meeting at the reticulum of the various bundles of fibers from both auricles and proceeding thence to the ventricles as the auriculoventricular bundle, would merely mean an economy of space.

The Relationship Between the Thyroid and Parathyroids.—J. Halpenny and F. D. Thompson (*Anat. Anz.*, 1909, xxxiv, 376) made a study of the parathyroids of the dog after extirpation of the thyroids, and found that to all intents and purposes the parathyroids become converted into thyroid tissue after such an operation. "The most noticeable feature about the thyroid tissue which has developed from parathyroid is the irregular shape of the vesicles, but the appearance thus presented is strikingly similar to that which is found in the thyroid gland after parathyroidectomy." Aside from the vesicles, there is found tissue in the normal thyroid which seems identical with that of the parathyroids, and "there seems to be no escape from the conclusion that in mammals the thyroid and parathyroid tissues are related to each other, and that the connections are not only physiologic, but anatomic." There being no symptoms after removal of the thyroids, when the parathyroids are left behind, a second operation, in which the parathyroids were removed, was performed. "After removal of the altered parathyroids, the animal showed practically no symptoms for a month, but after this period it developed tremors, became restless and idiotic, and suffered from conjunctivitis, loss of hair and eczema. Death occurred forty-four days after the second operation, and there was no typical tetany at any time."

Classification of Sputum Findings.—I. G. Gabrilowitsch proposes as an improvement on the present methods of classification the following four groups as sufficiently accurate to class the ordinary run of cases: 1. From 1 to 10 bacilli in entire preparation. 2. From 1 to 10 bacilli in each field. 3. More than 10 bacilli in each field. 4. Multitudes of bacilli in each field. In his communication in the *Russki Vrach*, 1909, viii, 298, he shows how the outcome in large numbers of cases corresponded to the above grouping, and that more minute classification is superfluous.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

STOVAIN—NOT A NEW ANESTHETIC

To the Editor:—Please refer me to the literature on the new anesthetic, stovain. F. T. BASCOM, Rochester, N. Y.

ANSWER.—Stovain is not in any proper sense a new anesthetic; it was discovered by Fourneau and the discovery was presented in his name to the Academy of Sciences by Haller in February, 1904. It has a considerable literature. References to the modification of spinal anesthesia suggested by T. Jonnesco are given in THE JOURNAL, Nov. 27, 1909, p. 1831. Newspaper accounts have generally misrepresented the character of Jonnesco's modification and have designated him as the discoverer of stovain and frequently have omitted reference to his use of strychnin as an adjuvant. A full description of stovain can be found in New and Nonofficial Remedies, p. 123.

Below are given references to some of the articles on the use of stovain which have appeared in English or which have been abstracted in THE JOURNAL. An exhaustive list of the literature on the subject would require too much space.

Coakley, C. G.: Report on the Use of Stovain, *Med. News*, New York, April 15, 1905.

Schiff: Stovain as a Local Anesthetic, *Deutsch. med. Wchnschr.*, Aug. 31, 1905; abstr. in THE JOURNAL A. M. A., Oct. 14, 1905, p. 1209.

Trautenroth: Intoxication from Stovain, *Deutsch. med. Wchnschr.*, 1906, xxxii, No. 7; abstr. in THE JOURNAL A. M. A., April 14, 1906, p. 1147.

Munchmeyer, O.: Spinal Stovain Anesthesia, *Beitr. z. klin. Chir.*, August, 1908, lix; abstr. in THE JOURNAL A. M. A., Oct. 10, 1908, p. 1287.

Willis, C. S., and Wallace, D.: Ten Cases of Spinal Anesthesia, *Australasian Med. Gaz.*, Nov. 20, 1907.

Torrance, G.: Stovain Spinal Anesthesia, with over 5,500 Cases from the Literature, *Surg., Gynec. and Obst.*, December, 1907.

Duncan, H. R.: Six Cases of Stovain Spinal Anesthesia, *Intercolonial Med. Jour. of Australasia*, November, 1907.

McGavin, L. H.: Fifty Cases of Stovain Analgesia by the Intraspinal Injection, *Lancet*, London, April 11, 1908.

Newman, A.: Spinal Anesthesia, *California State Jour. Med.*, March, 1908; abstr. in THE JOURNAL A. M. A., May 16, 1908, p. 1653.

Hardouin, P.: Deaths after Spinal Stovain Anesthesia, *Arch. générales de chir.*, Aug. 25, 1908; abstr. in THE JOURNAL A. M. A., Oct. 3, 1908, p. 1191.

Spielmeyer, W.: Modification in Nervous System after Stovain Anesthesia, *München. med. Wchnschr.*, Aug. 4, 1908; abstr. in THE JOURNAL A. M. A., Sept. 12, 1908, p. 955.

Sabadini: 679 Operations Performed under Spinal Anesthesia (Cocain or Stovain) by Tuffier's Method, *Lancet*, London, Oct. 24, 1908.

DIVISION OF FEES

To the Editor:—Please refer me to articles in discussion of or decisions of medical societies on the question of division of fees as applied to ordinary consultant practice. T. H., Toledo, Ohio.

ANSWER.—The following references may be consulted:

Saunders, Bacon: Division of Fees and Giving Commissions, Texas State Jour. of Med., January, 1909; abstr. in THE JOURNAL A. M. A., Oct. 31, 1908, p. 1536.

Queries and Minor Notes: Etiquette as to Fee for Substitute Obstetrician, THE JOURNAL A. M. A., Oct. 5, 1907, p. 1206.

Discussion, Southwestern Tri-State Med. Association of Texas, Oklahoma and Indian Territory, Nov. 8-9, 1905; abstr. in THE JOURNAL A. M. A., Dec. 2, 1905, p. 1755.

Queries and Minor Notes: Fees of Attending Physician and Consultant who Operates, THE JOURNAL A. M. A., Aug. 12, 1905, p. 479.

Fee-Splitting in the French Courts; abstr. in THE JOURNAL A. M. A., Aug. 1, 1903, p. 321 (from *Progrès Médical*).

Editorial: Dichotomy, or the Division of Fees, THE JOURNAL A. M. A., Feb. 28, 1903, p. 590; June 20, 1903, p. 1729.

Brown, R.: Fee Division, *California State Jour. Med.*, April 1909.

Larkin, J. C.: Dichotomy, *Ohio State Med. Jour.*, July, 1907.

Earle, C. B.: Should there be a Division of Fees? *Jour. South Carolina Med. Assn.*, Dec. 21, 1906.

McKee, E. S.: Division of Fees, *St. Louis Med. Review*, July 14, 1906.

HEROIN HYDROCHLORID AND OPIUM

To the Editor:—Please state the relative value of heroin hydrochlorid and opium. How much opium does one grain of heroin represent? H. G. HEANEY, Corpus Christi, Tex.

ANSWER.—Heroin hydrochlorid is described in New and Non-official Remedies, pp. 95-97. It will be noted that this description shows that heroin is not a native constituent of opium, but is a synthetic derivative of morphin. We cannot state therefore just how much opium one grain represents but can give only the relative dosage, the dose of heroin being from 0.0025 to 0.005 gm. (1/24 to 1/12 grain), while the average dose of opium is 0.06 gm. (1 grain).

The Public Service

Medical Department of the Army

Changes for the week ended Dec. 11, 1909:

Eastman, William R., capt., granted leave of absence for 2 months, when relieved from duty in the Philippines Division.

Baker, Frank C., major, granted leave of absence for 20 days.

Ruffner, Ernest L., Hallovan, Paul S., Phalen, James H., Billingslea, Charles C., capts., med. corps; and Sievers, Robert E., Koyle, Fred T., Myers, William H., 1st lieuts., M. R. C., relieved from duty in Philippines Division, March 15, 1910, and directed on arrival at San Francisco, to report to the Adjutant General of the Army for further orders.

Pipes, Henry F., capt., ordered to New York and Chicago, to study the manufacture and manipulation of the *x*-ray machine.

O'Connor, Roderic P., capt., granted leave of absence for 1 month, with permission to apply for an extension of 1 month.

Kendall, William P., major, granted 14 days' leave of absence.

Harris, H. S. T., lieut. col., detached member of examining board at San Francisco, for duty only during examinations of Captains John A. Murtagh, William H. Brooks and Robert M. Thornburgh, for promotion.

Murtagh, John A., capt., ordered to Fort Leavenworth, Kan., for duty.

O'Connor, R. P., capt., ordered to Fort Screven, Ga., for duty.

Smith, Herbert M., capt., ordered to Fort Casey, Wash., for duty.

Brechemin, Louis, Jr., capt., ordered to Army General Hospital, San Francisco, Cal., for duty.

Holmes, Thomas G., 1st lieut., M. R. C., order for honorable discharge revoked; will proceed at the expiration of his present leave of absence to Fort Sheridan, Ill., for duty.

Stuckey, Harrison W., 1st lieut., M. R. C., ordered to proceed to Fort Adams, R. I., for temporary duty.

Little, William L., capt., ordered to Fort Hood, N. Y., for temporary duty.

Kennedy, James M., major, granted 30 days' leave of absence.

Sweazey, Verge E., capt., relieved from treatment at the Walter Reed Army General Hospital, and from further duty at Plattsburg Barracks, N. Y., and ordered to the Army and Navy General Hospital, Hot Springs, Ark., for duty.

Kress, Clarence C., 1st lieut., M. R. C., resignation accepted by the President to take effect Feb. 11, 1910.

Laflamme, Frank L. K., dental surgeon, ordered to Rock Id. Arsenal, Ill., for temporary duty.

Medical Corps of the Navy

Changes for the week ended Dec. 11, 1909:

Nash, F. S., medical inspector, commissioned medical inspector from Nov. 20, 1909.

Minter, J. M., P. A. surgeon, commissioned passed assistant surgeon from Aug. 1, 1909.

Price, A. F., medical director, placed on the retired list from Dec. 13, 1909.

Public Health and Marine-Hospital Service

Changes for the fourteen days ended Dec. 8, 1909:

Cofer, L. E., asst.-surgeon-general, directed to proceed to Ellis Island and Staten Island, N. Y., on special temporary duty.

Irwin, Fairfax, surgeon, leave granted for 1 month from Nov. 22, 1909, amended to read from November 26.

Carter, H. R., surgeon, granted 10 days' leave of absence from Nov. 25, 1909, on account of sickness.

Wasdin, Eugene, surgeon, granted 1 month's leave of absence from Nov. 22, 1909, on account of sickness.

White, J. H., surgeon, granted 10 days' leave of absence from Dec. 1, 1909.

McMullen, John, P. A. surgeon, granted 7 days' leave of absence from Nov. 23, 1909, under paragraph 191, Service Regulations.

von Ezdorf, R. H., and Amesse, J. W., P. A. surgeons, detailed to represent the Service at the Fourth International Sanitary Convention of American Republics, to be held in San Jose, Costa Rica, Dec. 25, 1909, to January 2, 1910.

Foster, M. H., P. A. surgeon, leave of absence granted for 15 days, en route, amended to read 6 days from November 12, 1909.

Billings, W. C., and Gwyn, M. K., P. A. surgeons, detailed as members of a Revenue-Cutter Service Retiring Board to meet at Arundel Cove, Md., Dec. 9, 1909.

Robinson, D. E., P. A. surgeon, granted 28 days' leave of absence from Nov. 9, 1909, on account of sickness.

McClintic, T. B., P. A. surgeon, granted 6 days' leave of absence from Nov. 19, 1909, under paragraph 191, Service Regulations.

Schereschewsky, J. W., P. A. surgeon, directed to report at Bureau on special temporary duty.

Ebersole, R. E., P. A. surgeon, leave of absence granted for 2 months from Aug. 12, 1909, amended to read 1 month and 29 days from Aug. 25, 1909.

Robertson, H. McG., P. A surgeon, granted 4 days' leave of absence from December 4, 1909.

Sweet, Ernest A., P. A. surgeon, granted 10 days' leave of absence from Nov. 25, 1909.

Marshall, E. R., asst.-surgeon, granted 1 month's leave of absence from Dec. 10, 1909.

Bailey, C. A., acting asst.-surgeon, granted 20 days' leave of absence from Dec. 12, 1909.

Deerhake, Wm. A., acting asst.-surgeon, granted 2 days' leave of absence in November, 1909, under paragraph 210, Service Regulations.

Schwartz, Louis, acting asst.-surgeon, granted 2 days' leave of absence, Nov. 24 and 30, 1909, without pay.

Wakefield, H. C., acting asst.-surgeon, granted 7 days' leave of absence from Nov. 22, 1909, under paragraph 210, Service Regulations.

BOARD CONVENED

Board of medical officers convened to meet at San Francisco, Cal., Dec. 1, 1909, for the purpose of examining an alien. Detail for the board: Passed Assistant Surgeon W. W. King, chairman; Passed Assistant Surgeon F. E. Trotter; Assistant Surgeon R. A. C. Wollenberg, recorder.

Health Reports

The following have been reported to the Public Health Service, during the week ended Dec. 3, 1909:

SMALLPOX—UNITED STATES

Alabama: Montgomery, Nov. 13-20, 12 cases; Birmingham, 1 case.
District of Columbia: Washington, Nov. 13-20, 1 case.
Florida: Jacksonville, Nov. 13-20, 1 case.
Georgia: Macon, Nov. 15-28, 5 cases.
Indiana: Muncie, Nov. 13-20, 2 cases.
Kansas: Kansas City, Nov. 13-20, 3 cases.
North Dakota: Grand Forks County, Sept. 1-30, 2 cases.
Utah, Oct. 1-31, 117 cases, 1 death, in 8 counties.
Washington: Spokane, Nov. 6-13, 1 case.
Wisconsin: La Crosse, Nov. 13-20, 1 case.

SMALLPOX—INSULAR

Philippine Islands: Manila, Oct. 9-23, 2 cases.

SMALLPOX—FOREIGN

Brazil: Bahia, Oct. 15-22, 15 cases, 10 deaths; Para, Oct. 23-30, 1 case, 1 death; Pernambuco, Sept. 1-15, 20 deaths.
China: Amoy, Oct. 9-16, 1 death.
Egypt: Suez, Oct. 14-Nov. 4, 1 case, 2 deaths.
India: Madras, Oct. 9-15, 1 death.
Italy, general, Nov. 1-14, 82 deaths; Naples, Nov. 7-14, 20 cases, 7 deaths.
Mexico: Mexico City, Oct. 2-9, 4 deaths; Oct. 16-23, 2 deaths; Monterey, Oct. 14-21, 1 death.
Persia: Guilan, province, Oct. 4, present; Mazanderan, present.
Russia: Libau, Nov. 1-7, 2 cases, 1 death; Riga, Aug. 1-31, 18 cases, 12 deaths; Sept. 1-30, 11 cases, 3 deaths.
Spain: Almeria, Oct. 1-31, 3 deaths; Madrid, 103 deaths.

YELLOW FEVER

Brazil: Bahia, Oct. 15-22, 1 case, 1 death; Manaos, Oct. 16-23, 1 death; Para, Oct. 23-Nov. 6, 8 cases, 7 deaths.
Ecuador: Guayaquil, Oct. 9-23, 6 deaths; Venezuela: La Guaira, Oct. 27-Nov. 6, 5 cases, 2 deaths, in vicinity.

CHOLERA—INSULAR

Philippine Islands: Manila, Oct. 9-16, 15 cases, 12 deaths; Oct. 16-23, 18 cases, 18 deaths; Provinces, Oct. 9-16, 308 cases, 240 deaths; Oct. 16-23, 256 cases, 202 deaths.

PLAGUE—FOREIGN

China: Amoy, Oct. 8-23, 49 deaths.
Germany: Andreischken, Nov. 7-13, 2 cases; Heydekrug, district, Nov. 18, 1 case.
India: Bombay, Oct. 12-19, 4 deaths; Madras, Oct. 9-15, 1 death.
Japan: Kobe, Oct. 30-Nov. 6, 1 case, 1 death; Moji, Oct. 6-13, 2 cases, 2 deaths; Wakamatsu, Oct. 23-30, 2 cases, 2 deaths.

PLAGUE

Brazil: Bahia, Oct. 14-22, 10 cases, 6 deaths; Pernambuco, Sept. 1-15, 1 death.
China: Amoy, Oct. 9-23, 77 deaths.
India, general, Oct. 9-16, 4,815 cases, 3,992 deaths; Bombay, Oct. 12-26, 24 deaths.
Japan: Kobe, Oct. 16-Nov. 6, 67 cases, 50 deaths; Osaka, Nov. 10, 1 case.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALABAMA: Montgomery, January 11. Chairman, Dr. W. H. Sanders.
ARIZONA: Phoenix, January 3-4. Sec., Dr. Ancil Martin.
COLORADO: State Capitol, Denver, January 4. Sec., Dr. S. D. VanMeter, 1723 Tremont Place.
DISTRICT OF COLUMBIA: Washington, January 10. Sec., Dr. George C. Ober, 210 B Street., S. E.
ILLINOIS: Coliseum Annex, Chicago, January 19-21. Sec., Dr. J. A. Egan, Springfield.
INDIANA: Room 120, State House, Indianapolis, January 11. Sec., Dr. W. T. Gott.
MINNESOTA: State University, Minneapolis, January 4. Sec., Dr. W. S. Fullerton, 214 American National Bank Bldg., St. Paul.
NEW HAMPSHIRE: State Library Bldg., Concord, January 4-5. Regent, Mr. H. C. Morrison.
NORTH DAKOTA: Grand Forks, January 4-6. Sec., Dr. H. M. Wheeler.
OKLAHOMA: Ione Hotel, Guthrie, January 11. Sec., Dr. Frank P. Davis, Enid.
RHODE ISLAND: Room 313, State House, Providence, January 6-7. Sec., Dr. Gardner T. Swarts.
SOUTH DAKOTA: Sioux Falls, January 12-13. Sec., Dr. F. W. Freyberg, Mitchell.
UTAH: State Building, Salt Lake City, January 3. Sec., Dr. G. F. Harding, 310 Templeton Bldg.
VERMONT: Montpelier, January 11-13. Sec., Dr. W. Scott Nay, Underhill.
WASHINGTON: Spokane, January 4. Sec., Dr. J. Clinton McFadden, 503-5 People's Bank Bldg., Seattle.
WISCONSIN: Milwaukee, January 11. Sec., Dr. John M. Beffel, 3200 Clybourn Street.

Georgia Homeopathic July Report

Dr. R. E. Hinman, secretary of the Homeopathic Board of Medical Examiners of Georgia, reports the written examination held at Atlanta, July 19, 1909. The number of subjects examined in was 12; total number of questions asked, 120; percentage required to pass, 75. Only one candidate, a graduate of Gate City Medical College, 1908, was examined, and he failed, with a grade of 68.8 per cent.

Colorado October Report

Dr. S. D. VanMeter, secretary of the Colorado State Board of Medical Examiners, reports the written examination held at Denver, Oct. 5, 1909. The number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75. Seventeen applicants were examined, of whom 12 passed, including 1 osteopath, and 5 failed. Forty-five candidates were registered on presentation of satisfactory credentials, including state licenses. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
University of Colorado	(1909)	80.7, 85.3
Denver College of Physicians and Surgeons	(1909)	76.6, 77.1, 79.7
Denver and Gross College of Medicine	(1908)	76.4; (1909) 77.3, 77.7, 78.5, 80.
Louisville Medical College	(1906)	75.4

FAILED		
Denver College of Physicians and Surgeons	(1909)	56.7
Maryland Medical College	(1905)	66.8
Barnes Medical College	(1906)	66
Lincoln Medical College	(1908)	68.5
Meharry Medical College	(1907)	52

LICENSED ON CREDENTIALS College.	Year Grad.	State Licenses.
Yale Medical School	(1898)	Connecticut
Rush Medical College	(1890)	Wisconsin
Northwestern University Medical School	(1901)	Indiana
Bennett Medical College	(1894)	Nebraska
Coll. of Phys. and Surg., Chicago	(1891) (1902) (1905)	Illinois
American Medical Missionary College	(1901)	Illinois
Hahnemann Medical College and Hospital, Chicago	(1892) (1889)	Iowa; (1889) Maine
University of Iowa, Homeopathic College	(1909)	Iowa
Keokuk Medical College, College of Physicians and Surgeons	(1905)	Illinois; (1906) Iowa
Drake University, College of Medicine	(1894)	Missouri; (1901) Iowa
University of Iowa, College of Medicine	(1890)	Penna.
Hospital College of Medicine, Louisville	(1898)	Illinois
Louisville Medical College	(1890)	Alabama; (1890) Virginia; (1894) Kansas
Tulane University of Louisiana	(1903)	Alabama
Baltimore Medical College	(1896)	Vermont; (1899) Ohio
Johns Hopkins University	(1906)	New York
College of Physicians and Surgeons, Baltimore	(1902)	Kansas
Missouri Medical College	(1881)	Oklahoma; (1888) Arkansas; (1891) Missouri
Marion Sims College of Medicine	(1897)	Illinois
Univ. Med. Coll., Kansas City	(1903)	Oklahoma; (1907) New Mexico
Barnes Medical College	(1899)	Illinois
St. Louis University	(1905)	Kansas; (1908) Illinois
New York Homeopathic Med. Coll. and Hosp.	(1893)	Penna.
Bellevue Hospital Medical College	(1883)	Nebraska
University of Buffalo	(1902)	New York
North Carolina Medical College	(1905)	N. Carolina
Western Reserve University	(1888)	Utah
Medical College of Ohio	(1895)	Ohio
Columbus Medical College	(1879)	Ohio
Medico-Chirurgical College, Philadelphia	(1896)	Penna.
Western Pennsylvania Medical College	(1906)	Penna.
University of the South	(1900)	New Mexico

District of Columbia April, July and October Reports

Dr. George C. Ober, secretary of the Board of Medical Supervisors of the District of Columbia, reports the written examinations held at Washington, April 13-16, July 13-16, and October 12-15, 1909. The number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75.

At the examination held April 13-16, the total number of candidates examined was 12, of whom 7 passed and 5 failed. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
George Washington University	(1907)	76.3, 80.4
Howard University	(1908)	77.9, 78
College of Physicians and Surgeons, Chicago	(1908)	75.1
Atlantic Medical College	(1908)	80.4
Cornell University Medical College	(1907)	89.3

FAILED		
George Washington University	(1908)	70
Howard University	(1902)	73.8
Baltimore Medical College	(1907)	*† 5.8
College of Physicians and Surgeons, Baltimore	(1908)	62.9
University of Pennsylvania	(1894)	56.4

At the examination held July 13-16, the total number of candidates examined was 22, of whom 13 passed and 9 failed. The report for one candidate is not complete. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
George Washington University	(1908) 82.4, 82.7; (1909) 76.8, 79.9, 81.2, 82.4, 83.1, 83.1.	75.6,
Howard University	(1908)	87.2
Georgetown University	(1909)	75
University of Michigan, College of Medicine	(1898)	78
Jefferson Medical College	(1894)	77.3

FAILED		
George Washington University	(1908) 4.9,* 65.9,** 69.1,† (1909) 71.5.	69.3;
Howard University	(1906) 65.5;† (1909)	72.7
Maryland Medical College	(1907)	65.2
Baltimore Medical College	(1907)	‡66.3

At the examination held October 12-15, the total number of candidates examined was 23, of whom 19 passed and 4 failed. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
Howard University	(1902) 87.7; (1908) 76.9, 76.9, 78.3; (1909) 81.1.	
George Washington University	(1907) 75, 83.3; (1908) 89; (1909) 78.9, 80.6, 81.1, 86.7.	
University of Maryland	(1907)	87.1
Johns Hopkins University	(1907)	86.7
Baltimore Medical College	(1907)	75
Syracuse University	(1906)	81.7
University of Pennsylvania	(1899)	78.1
Woman's Medical College of Pennsylvania	(1909)	84.2
Hahnemann Medical College of Philadelphia	(1909)	88.6

FAILED		
George Washington University	(1908)	**66.5
Georgetown University	(1909)	71
Howard University	(1906) 71.1;‡ (1909)	61.3

* Completed one branch only.
** Second Examination.
† Third Examination.
‡ Fourth Examination.

Illinois June and July Reports

Dr. J. A. Egan, secretary of the Illinois State Board of Health, reports the written examinations held in Chicago, June 16-18, and July 20-22, 1909. The number of subjects examined in was 16; total number of questions asked, 100; percentage required to pass, 75.

At the examination held June 16-18, the total number of candidates examined was 291, of whom 263 passed, 27 failed, and 1 withdrew. The following colleges were represented:

College	PASSED Year Grad.	Total No. Examined.
George Washington University	(1908)	1
Bennett Medical College	(1909)	18
Chicago College of Medicine and Surgery	(1909)	29
College of Medicine and Surgery, Chicago	(1909)	2
Hahnemann Medical College and Hospital, Chicago	(1907) (8, 1909)	9
Hering Medical College	(1909)	6
Illinois Medical College	(1909)	8
Jenner Medical College	(1909)	5
National Medical University	(1909)	1
Northwestern University Medical School	(1909)	92
College of Physicians and Surgeons, Chicago	(1909)	43
Reliance Medical College	(1909)	8
Rush Medical College	(1906) (29, 1909)	30
Medical College of Indiana	(1896)	1
University of Louisville	(1909)	5
University of Nashville	(1909)	1
University of Toronto, Ontario	(1893)	1
University of Dorpat, Russia	(1887) (1903)	2
University of Edinburgh, Scotland	(1893)	1
FAILED		
Bennett Medical College	(1909)	5
Chicago College of Medicine and Surgery	(1909)	1
Northwestern University Medical School	(1909)	2
College of Physicians and Surgeons, Chicago	(1909)	4
Reliance Medical College	(1909)	4
Hahnemann Medical College and Hosp., Chicago	(1909)	1
Harvey Medical College, Chicago	(1898)*	1
Kansas City Homeopathic Medical College	(1891)	1
Hospital College of Medicine, Louisville	(1904)**	1
University of Louisville	(1908) (2, 1909)	3
Meharry Medical College	(1909)	1
University of Tennessee	(1901)	1
University of Paris, France	(1892)	1
University of Dorpat, Russia	(1896)	1

At the examination held July 20-22, the total number of candidates examined was 107, of whom 83 passed and 24 failed. The following colleges were represented:

College	PASSED Year Grad.	Total No. Exam'd.
Yale Medical College	(1909)	1
Bennett Medical College	(1909)	4
Chicago Coll. of Med. and Surg.	(2, 1908) (14, 1909)	16
College of Medicine and Surgery, Chicago	(1909)	1
Hahnemann Med. Coll. and Hosp., Chicago	(1907) (2, 1909)	3
Illinois Medical College	(1909)	3
Jenner Medical College	(2, 1908) (4, 1909)	6
National Medical University	(1908)	1
Northwestern University Medical School	(1909)	12
College of Physicians and Surgeons, Chicago	(1909)	14
Reliance Medical College	(1909)	4
Rush Medical College	(1909)	10
Keokuk Medical College, College of Phys. and Surg.	(1907)	1
University of Louisville	(1909)	1
Johns Hopkins University	(1909)	1
Maryland Medical College	(1909)	1
St. Louis College of Physicians and Surgeons	(1909)	2
Queen's University, Kingston, Ontario	(1909)	1
University of Nashville	(1909)	1
FAILED		
Bennett Medical College, Chicago	(1909)	3
Hahnemann Med. Coll. and Hosp, Chicago	(1908)* (1908)	2
Illinois Medical College	(1908)† (1909)	2
Jenner Medical College	(1907)* (1908) (3, 1909)	5
National Medical University, Chicago	(1907)† (1909)	2
College of Physicians and Surgeons, Chicago	(1909)	1
Keokuk Medical College, College of Phys. and Surg.	(1908)*	1
Kentucky School of Medicine	(1902)	1
Barnes Medical College	(1908)‡	1
St. Louis Coll. of Phys. and Surg.	(1906)** (3, 1909)*	4
University Medical College, Kansas City	(1897)	1
Meharry Medical College	(1909)	1

* Second examination.
** Third examination.
† Fourth examination.
‡ Fifth examination.

Marriages

HARRY X. CLINE, M.D., to Miss Grace Goodall, both of Marion, Ill., December 7.

ISADORE COHN, M.D., to Miss Millie Siegmund, both of New York City, November 24.

H. HASTINGS WYMAN, M.D., Jr., to Miss Ada Miller, both of Aiken, S. C., November 25.

AUGUSTUS STOUT HUNT, M.D., to Miss Tossie Mains, both of Jerseyville, Ill., December 8.

CALLIE A. RENNOE, M.D., to Miss Veronica Starr, both of South Bend, Ind., October 28.

JOHN HENRY OHLY, M.D., to Miss Helen Hallowell, both of New York City, November 27.

MELVIN JOHN ROWE, M.D., Kalamazoo, Mich., to Miss Derthick of Ionia, Mich., November 25.

HENRY ALAN NAYLOR, M.D., Pikesville, Md., to Miss Louise Requardt, at Baltimore, December 3.

JOHN JACOB RUDIN, M.D., Galesville, Ill., to Miss Jessie M. Nash, of Mansfield, Ill., November 13.

ROYALE HAMILTON FOWLER, M.D., to Miss Lillie Marshall, both of Brooklyn, N. Y., November 24.

DOUGLAS C. RAMSEY, M.D., Mount Vernon, Ind., to Miss Rose Shellen, of Evansville, Ind., December 1.

ROBERT C. KIRKWOOD, M.D., Boykins, Va., to Miss Rose Eleanor Phasey, of Norfolk, November 18.

JOHN W. TURLEY, M.D., Desloge, Mo., to Miss Lillian Boyd, of Esther, Mo., at St. Louis, November 18.

HENRY FROST HOOKER, M.D., Danville, Ill., to Miss Nellie McGrath, of Green Bay, Wis., November 25.

JAMES ALEXANDER HARVEY, M.D., to Miss Regina Jones, both of Chicago, at New York City, November 30.

HARRY P. SHUGERMAN, M.D., U. S. Army, to Miss Eleanor C. Grubb, at Port McHenry, Md., November 8.

THOMAS BARNES FUTCHER, M.D., Baltimore, to Miss G. Marjorie Howard, of Montreal, Que., November 24.

HENRY L. BROWN, M.D., U. S. Army, to Miss Florella Fredcrika Lightbourne, of Key West, Fla., November 13.

GEORGE OLIVER SHARRETT, M.D., Cumberland, Md., to Miss Eva Gertrude Basford, at Baltimore, November 24.

ALLEN HENRY WRIGHT, M.D., Stamford, Vt., to Miss Charlotte Frances Park, of Waterloo, N. Y., November 17.

JOHN L. CONOVER, M.D., to Miss Hattie Eaton, both of North Crandon, Wis., at Menominee, Mich., November 23.

HUGO ABRAHAM FREUND, M.D., Detroit, Mich., to Miss Hortense Goldsmith, of Ligonier, Ind., at Detroit, November 9.

MICHAEL J. SHAUGHNESSY, M.D., Wabasha, Minn., to Miss Mae C. O'Brien, of South Framingham, Mass., November 23.

ABRAHAM NOWELL CREADICK, M.D., Portland, Ore., to Miss Emma Greenwood DeBow, of Philadelphia, Pa., November 23.

WILLIAM ELLICOTT TYSON, M.D., Detroit, Mich., to Miss Elizabeth McPherson Weems, at Washington, D. C., November 27.

THOMAS ROLLINS MARSHALL, M.D., Richmond, Va., to Miss Sue Seddon Taliaferro Wellford, of Gloucester county, Va., at Richmond, November 23.

Deaths

Andrew Caldwell Mailer, M.D. Rush Medical College, Chicago, 1878; Bellevue Hospital Medical College, New York City, 1882; a member of the American Medical Association and National Association of Railway Surgeons; past president of the Fox River Valley Medical Society; local surgeon of the Chicago, Milwaukee and St. Paul Railway at DePere, Wis.; for several years superintendent of the public schools of the city and president of the school board; a member of the state senate from the second district in 1897 and 1899, and twice mayor of DePere; died at his home, December 3, from tuberculosis, aged 56.

William H. Sheets, M.D. Cincinnati College of Medicine and Surgery, 1862; a member of the Indiana State Medical Association; assistant surgeon U. S. Army throughout the Civil War; secretary of the Clark County, Ind., Board of Health; a member of the Jeffersonville Board of Health for twenty years, and formerly ten years city health officer; at one time physician to the Indiana State Prison, South Jeffersonville, and for several years a member of the local pension board; a licensed minister of the Methodist Episcopal church; died at his home, December 1, from tuberculosis, aged 76.

George Zigler Bretz, D.D.S., 1851; M.D. Long Island College Hospital, Brooklyn, N. Y., 1864; major and surgeon in the One Hundred and First Pennsylvania Volunteer Infantry; afterward post surgeon of the Naval Hospital, Plymouth, N. C.; assistant surgeon of the Seventh Pennsylvania Volunteer Cavalry during the Civil War; for five years adjunct surgeon to the Long Island College Hospital; health inspector of Brooklyn, N. Y.; and formerly a member of the Medical Society of the County of Kings; was found asphyxiated by gas in his room in Brooklyn, December 4, aged 84.

Colin Charles Sewell, M.D. University of Edinburgh, Scotland, 1864; McGill University, 1869; M.R.C.P., Edinburgh; colonel and surgeon to the Royal Canadian Artillery, retired, with active service during the Riel rebellion in 1885; principal medical officer of the Quebec District; a governor of the Col-

lege of Physicians and Surgeons, Quebec; died at his home in Quebec, December 1, from pneumonia, aged 68. He was given a military funeral and the pallbearers were selected from the officers of the permanent and volunteer corps.

Milton Smith Pixley, M.D. Miami Medical College, Cincinnati, 1866; a member of the Ohio State Medical Association; hospital steward of the Ninety-first Ohio Volunteer Infantry during the Civil War; formerly city physician and a member of the city council and school board of Portsmouth, Ohio; one of the organizers of the Hempstead Academy of Medicine; and secretary of the Scioto County Medical Society; died at his home in Portsmouth, November 29, from cancer, aged 67.

Erasmus Darwin Leavitt, M.D. Harvard Medical School, Boston, 1870; formerly a member of the American Medical Association; a member and first president of the Montana State Medical Association; a pioneer physician of Montana; member of the first two legislatures of the state, and formerly president of the State Board of Medical Examiners; died at his home in Butte, November 30, from carcinoma of the liver, aged 78.

Thomas Griswold Comstock, M.D. Washington University, St. Louis, 1849; Doctor of Midwifery and Master in Obstetrics; Imperial Royal University of Vienna, Austria, 1856; Hahnemann Medical College, Philadelphia, 1851; consulting physician to the St. Louis Free Hospital, and president of the medical staff; physician to the Good Samaritan Hospital; died at his home in St. Louis, December 1, from nephritis, aged 84.

John Perkins Furniss, M.D. New Orleans School of Medicine, 1866; a member of the American Medical Association; a member of the State Board of Censors and Medical Examination; assistant surgeon in the Confederate Service from 1862 to 1865; grand senior life councilor of the Medical Association of the State of Alabama; died at his home in Selma, December 3, aged 68.

Samuel Brightwell Smallwood, M.D. New York University, New York City, 1864; a member of the Medical Society of the State of New York; of Astoria, Long Island City, N. Y.; a member of the consulting board of the New York Eye and Ear Hospital; died in the Post-Graduate Hospital, New York City, November 28, after an operation for ptomaine poisoning, aged 69.

Robert Paine Wendell, M.D. Georgetown University, Washington, D. C., 1892; of Aberdeen, Miss.; a member of the American Medical Association; local surgeon for the Frisco System; was shot, beaten and stabbed to death, November 28, in a hotel in Aberdeen, by a patient who was suffering from alcoholic mania, aged 42.

Frederick Bostock Webb., M.D. University College of Medicine, Richmond, Va., 1901; a member of the Medical Society of Virginia; for several years a missionary in China; since 1902, physician in charge of the Roanoke City Smallpox Hospital; died in the Relay Sanatorium, near Baltimore, December 3, aged 43.

Levin Gillis Owings, M.D. University of Maryland, Baltimore, 1900; of Glenelg, Md.; formerly a member of the American Medical Association; a member of the Medical and Chirurgical Faculty of Maryland; died at the home of his father in Roxbury Mills, November 30, from tuberculosis, aged 33.

Hiram W. Gordon, M.D. University of Pennsylvania, Philadelphia, 1858; formerly a member of the American Medical Association; a member of the Medical Society of Virginia; died at his home in Madison, April, 1908, from cerebral embolism, due to valvular disease of the heart, aged 76.

Pierre A. Banker, M.D. New York Homeopathic Medical College, New York City, 1879; a member of the American Medical Association; excise commissioner-elect of Elizabeth, N. J.; a veteran of the Civil War; died suddenly at his home in Elizabeth, December 2, from angina pectoris, aged 63.

Sophia Presley, M.D. Womans Medical College of Pennsylvania, Philadelphia, 1879; a member of the Medical Society of New Jersey; formerly instructor in surgery in her alma mater; died suddenly at her home in Camden, November 28, from heart disease, aged 65.

David Bennett, M.D. Bellevue Hospital Medical College, New York City, 1866; formerly of Richmond and Lexington, Ky.; at one time president of the National Exchange Bank of Lexington; died in a private sanitarium at Atlanta, Ga., December 2, from gastritis, aged 68.

Junius L. Mann, M.D. Medical College of the State of South Carolina, Charleston, 1901; of Anderson, S. C.; a member of the South Carolina Medical Association; died suddenly at the home of his father in West Union, S. C., November 29, from heart disease, aged 31.

Frank Hickman Matlack, M.D. University of Pennsylvania, Philadelphia, 1872; a member of the Medical Society of the State of Pennsylvania; for twenty years a practitioner of Turtle Creek; died at his home in East End, Pittsburg, November 30, aged 67.

George LeHouillier (license, Mo., 1897); a member of the Florrisant, Mo., Board of Health; for many years house physician to the Loretto Academy and St. Stanislaus Seminary; died at his home, November 25, from rheumatic endocarditis, aged 51.

Henry C. Crowder, M.D. Rush Medical College, Chicago, 1874; a member of the American Medical Association; local surgeon of the Southern Pacific Railway at Tracy, Cal.; died at his home in that city, November 28, from heart disease, aged 65.

Joseph C. Grant, M.D. Kentucky School of Medicine, Louisville, 1896; formerly of Lena, Wis.; a member of the American Medical Association; died at the home of his sister in Livingston Manor, N. Y., November 28, from influenza, aged 40.

Lycurgus Thomas, M.D. University of Tennessee, Nashville, 1907; physician in charge of the Woodward Iron Works, Dolomite, Ala.; died in the City Hospital, Bessemer, Ala., November 25, from typhoid fever, aged 25.

William J. Laird, M.D. College of Physicians and Surgeons, Chicago, 1896; formerly surgeon for the Bay de Noc Company, at Nahma, Mich.; died in Englewood, Chicago, November 15, from pulmonary tuberculosis, aged 45.

Harry Milton Davison, M.D. Western Pennsylvania Medical College, Pittsburg, 1897; formerly of Franklin, Pa.; died at his home in York, Pa., November 22, from acute mania, said to have been due to alcoholism, aged 38.

Franklin Hinkle, M.D. University of Pennsylvania, Philadelphia, 1846; a member of the American Medical Association; assistant surgeon during the Civil War; died at his home in Columbia, Pa., December 2, aged 85.

Stephen Dudley Harrell, M.D. Medical College of the State of South Carolina, Charleston, 1889; a member of the South Carolina Medical Association; died at his home in Lamar, November 29, aged 48.

William E. King, M.D. University of Tennessee, Nashville, 1898; of Lafayette, Tenn.; while riding through the public square of that place, November 27, was shot and instantly killed, aged about 40.

William Augustine Daniel, M.D. Savannah (Ga.) Medical College; a Confederate veteran; died at his home in Jacksonville, Fla., April 7, from chronic hepatitis, due to malarial toxemia, aged 74.

John Clinton Barnes (license, years of practice, Ill., 1877); for forty-four years an eclectic practitioner of Illinois; died in a hotel in Arcola, November 23, from acute nephritis, aged 74.

Micajah Quincy Holt, M.D. Jefferson Medical College, Philadelphia, 1849; of Wakefield, Va.; died in Newport News, Va., November 6, from cirrhosis of the liver, aged 83.

Thomas B. Hicks, M.D. Cleveland (Ohio) Medical College, 1872; died at his home in New Haven, Ill., December 3, from injuries inflicted by an insane patient, aged 68.

Isabella M. Wilson, M.D. New York Medical College and Hospital for Women, 1894; died at her home in Middletown, N. Y., November 30, from pneumonia, aged 58.

Wiley Van Buren Turner, M.D. University of Nashville and Vanderbilt University, Nashville, 1860; died at his home in Greenway, Ark., November 26, aged 75.

Thomas Jefferson Glines, M.D. Dartmouth Medical School, Hanover, N. H., 1853; an eclectic practitioner of Hebron, N. Y.; died at his home recently, aged 82.

Thomas A. White, M.D. Medical College of Indiana, Indianapolis, 1881; died suddenly at his home in Noblesville, Ind., December 3, from asthma, aged 61.

Oscar Green Chamblee, M.D. University of Nashville, Tenn., 1907; of North Birmingham, Ala.; died November 28, at a hospital in Birmingham, aged 26.

Joseph A. Pujos, M.D. Tulane University, New Orleans, 1896; formerly of Schriever, La.; died at his home in Thibodeaux, November 30, aged 47.

John Odie Grove, M.D. University of the South, Sewanee, Tenn., 1904; died at his home in Bradenville, Pa., November 25, from pneumonia, aged 32.

Edward Ayres Russell, M.D. Kentucky School of Medicine, Louisville, 1893; of Butler, Pa.; died in Cambridge Springs, Ohio, November 29, aged 40.

John C. Miller, M.D. Kentucky School of Medicine, Louisville, 1907; of Weeleetka, Okla.; was shot and killed near that place, August 25, aged 29.

Donald A. MacPherson, M.D. Long Island College Hospital, Brooklyn, 1895; died at his home in Brooklyn, November 30, from pneumonia, aged 43.

George W. Nyce, M.D. Pennsylvania Medical College, Gettysburg, 1857; died at his home in Cohoes, N. Y., November 19, from paralysis, aged 74.

James Walker Evans, M.D. Missouri Medical College, St. Louis, 1868; died at his home in Kirkwood, Mo., November 22, from diabetes, aged 63.

John Calvin Cochran, M.D. Barnes Medical College, St. Louis, 1901; of Burkett, Texas; died suddenly in Coleman, Texas, November 23, aged 53.

John A. Fitzpatrick (license, Ill., 1880); of Lemont, Ill.; died in St. Joseph's Hospital, Joliet, Ill., December 1, from hemorrhage, aged 55.

Garnet P. Hyndman, M.D. Michigan College of Medicine and Surgery, Detroit, 1896; died at his home in Minot, N. D., recently, aged 37.

Charles Oscar Hawkins, M.D. New York University, New York City, 1873; of Brooklyn, N. Y.; died in Hoboken, N. J., October 3.

Thomas J. Meek (license, Miss.); died at his home near Courtland, Miss., September 27, from cirrhosis of the liver, aged 55.

Robert S. Brice, M.D. Kentucky School of Medicine, Louisville, 1882; died at his home in Keota, Iowa, November 23, aged 75.

David Zimbleman, M.D. Russia; died at his home in New York City, November 5, from heart disease, aged 32.

Medical Economics

THIS DEPARTMENT EMBODIES THE SUBJECTS OF ORGANIZATION, POSTGRADUATE WORK, CONTRACT PRACTICE, INSURANCE FEES, LEGISLATION, ETC.

The Duty of the State to the Sick

The following extract from the *Bulletin of the North Carolina Board of Health* for October, is not only of interest as showing the attitude of the health authorities in the South regarding Mr. Rockefeller's gift of $1,000,000 for the extermination of the hookworm disease but also contains several points which may be of value to those interested in the campaign for better health conditions in other states:

ONE MILLION DOLLARS' WORTH OF STOCK IN PUBLIC HEALTH

On the 26th of October a man whom all the world recognizes as one of the shrewdest business men that ever lived decided to invest one million dollars in public health.

This unprecedented investment should suggest to the public mind several interesting and significant inquiries: *First*, did Mr. Rockefeller put a million dollars in something that will not bring the desired returns? *Second*, did Mr. Rockefeller invest one million dollars in something theoretical, something nothing more than the dream of an idealist, something impracticable? Did this shrewd, calculating business man, for once, disregard all precedent and invest this sum of money without thoroughly investigating the value of his investment? Judging from his letter, he did not, for in this letter he says: "For many months my representatives have been inquiring into the nature and prevalence of "hookworm disease" and considering plans for mitigating its evils. I have delayed action in this matter only until *the facts as to the extent of the disease could be verified and the effectiveness of its cure and prevention demonstrated.*" (The italics are ours.) It is therefore apparent that Mr. Rockefeller did not take any one's word for the loss of health and life from hookworm and the practicability of its cure. He made his own investigation, and arrived at results that justified this reckless (?) investor in putting up one million dollars for the sanitary war against hookworm.

Now, scientists have for several years been claiming just what Mr. Rockefeller "verified" and "demonstrated," and, on these claims they have urged state governments to appropriate money for the preservation of such a cheap thing as human health and life. On the other hand, state governments, judging from their appropriations for different purposes, have considered it better business to spend the state's money on trees, plants, animals, birds, etc., as is well illustrated by the following story:

The Young Mother and the Fat Hog—Not a Fable; Simply Straight Goods

One time a little mother, who was only twenty-five years old, began to feel tired all the time. Her appetite had failed her for weeks before the tired feeling came. Her three little girls, once a joy in her life, became a burden to her. It was "Mamma," "Mamma," all day long. She never had noticed these appeals until the tired feeling came. The little mother also had red spots on her cheeks and a slight dry cough. One day, when dragging herself around, forcing her weary body to work, she felt a slight but sharp pain in her chest, her head grew dizzy and suddenly her mouth filled with blood. The hemorrhage was not severe, but it left her very weak. The doctor she had consulted for her cough and tired feeling prescribed bitters made of alcohol, water and gentian. This gave her false strength for a while, for it checked out her little reserve. When the hemorrhage occurred, she and all her neighbors knew she had consumption, and the doctor should have known it and told her months before.

Now she wrote to the State Board of Health and said: "I am told that consumption in its early stages can be cured by outdoor life, continued rest, and plenty of plain, good food. I do not want to die. I want to live and raise my children to make them good citizens. Where can I go to get well?" The reply was: "The great Christian State of Indiana has not yet risen to the mighty economy of saving the lives of little mothers from consumption. At present, the only place where you can go is a grave. However, the state will care for your children in an orphan asylum after you are dead, and then in a few years, a special officer will be paid to find a home for them. But save your life—never. That is a cranky idea;" for a member on the floor of the Sixty-first Assembly said so. "Besides," said he, "it isn't business. The state can't afford it." So the little mother died of the preventable and curable disease, the home was broken up, and the children were taken to the orphan asylum.

A big fat hog one morning found he had a pain in his belly. He squealed loudly and the farmer came out of his house to see what was the matter. "He's got the hog cholery," said the hird man. So the farmer telegraphed Secretary Wilson of the U. S. Agricultural Department (who said the other day he had 3,000 experts in animal and plant diseases), and the reply was: "Cert., I'll send you a man right away." Sure enough, the man came. He said he was a D.V.S. and he was, too. He had a government syringe and a bottle of government medicine in his handbag, and he went for the hog. It got well. It wasn't cranky for the government to do this, and it could afford the expense, for the hog could be turned into ham, sausage, lard and bacon. Anybody, even a fool, can see it would be cranky for the state to save the life of a little mother, and it could not afford it, either.

MORAL: Be a hog and be worth saving.

(The background of this story is laid in Indiana, but its truth applies with equal force to our own state. For while Indiana is spending $43,500 annually on her public health, North Carolina is spending the extravagant sum of $8,500 annually on our public health.)

Now, from what has been said, it is very evident that there exists a very great difference of opinion between John D. Rockefeller and the average state government as to the value of public health. Either one or the other has made a big mistake, and if the oil king has made a bad business move, it is about his first one. Whatever many people may think of his business methods, it would be rather difficult to find a sensible person who questions his business sense.

It is believed this gift will serve its chief purpose, not in the eradication of hookworm, which it will to a large extent accomplish, but as a demonstration to state governments of the value of human health and life. And when that good day arrives, legislatures will investigate and verify the unanimous conclusion of scientists and statisticians, namely, that our country is losing 250,000 lives or their equivalent, $400,000,000 from sickness every year. Then in a great sanitary war against preventable disease, state governments will honor John D. Rockefeller by following his lead.

POSTGRADUATE COURSE FOR COUNTY SOCIETIES

DR. JOHN H. BLACKBURN, DIRECTOR
BOWLING GREEN, KENTUCKY

[The Director will be glad to furnish further information and literature to any county society desiring to take up the course.]

Fourth Month—Fourth Weekly Meeting

TREATMENT OF PELVIC INFLAMMATION

NON-SURGICAL: General: Local, douche, tampon, massage, etc.

SURGICAL: Routes of Operation.—Abdominal section, technic of removal of appendages, of salpingo-oöphorectomy. Technic in (a) pus cases, (b) in adhesions, (c) in hemorrhage, (d) in intestinal opening. Indications and technic in abdominal hysterectomy.

VAGINAL SECTION: Indications for (a) posterior, (b) anterior vaginal section. Technic of vaginal hysterectomy by (a) ligature, (b) forci-pressure. Indications for vaginal incision and drainage. Relative advantages and disadvantages of abdominal and vaginal routes.

Monthly Meeting

Diagnosis and Treatment of Tuberculous Salpingitis.
Indications and Contraindications for Curettage.
Diagnosis of Pelvic Inflammation.

Fifth Month—First Weekly Meeting

General Subject for the Month: Diseases of the Stomach, Intestines and Pancreas

ANATOMY

SURFACE ANATOMY: Stomach, cardiac and pyloric orifices, curvatures. Small intestine. Large intestine. Cecum and appendix, ascending, transverse and descending colon, sigmoid. Pancreas.

GROSS AND MICROSCOPIC ANATOMY: Stomach. Important relations. Structure, serous, muscular, submucous and mucous coats. Glands, cardiac and pyloric. Blood-vessels, lymphatics and nerves. Small intestine. Duodenum, jejuno-ileum, length, relations, limits, diameters, mesenteric attachments, blood-vessels, nerves and lymphatics. Structure, serous, muscular, submucous and mucous coats. Valvulæ conniventes, villi crypts of Lieberkühn, Brunner's glands, lymph follicles. Large intestine. Portions, length, diameters, mesentery. Characteristics, bands, sacculations, appendices, epiploicæ. Difference in structure from small intestine. Blood-vessels, lymphatics, nerves. Pancreas. Location, length, size, portions, ducts, microscopic structure, blood-vessels, lymphatics.

PHYSIOLOGY OF DIGESTION

MASTICATION AND SALIVARY DIGESTION

GASTRIC DIGESTION: Effect of pepsin and hydrochloric acid, of rennin. Effect on other foods. Absorption from stomach. Movements of the stomach.*

INTESTINAL DIGESTION: Pancreatic secretion, composition, three enzymes, secretin and mechanism of pancreatic secretion, enterokinase, effect of each enzyme in digestion. Succus entericus, enzymes present and functions of each. Intestinal movements, peristaltic and pendular. Absorption from intestine of carbohydrates, of fats, of proteins. Digestion and absorption in large intestines.

REFERENCE BOOKS FOR THE FIFTH MONTH

Hemmeter: Diseases of the Stomach and Intestines.
Boas: Diseases of the Stomach; of the Intestines.
Einhorn: Diseases of the Stomach and Intestines.
Nothnagel's Practice.
Opie: Diseases of the Pancreas.
Billings: Diseases of the Digestive Tract.

* Howell: Physiology, 2d Edition, p. 661.

Society Proceedings

COMING MEETINGS

American Physiological Society, Washington, D. C., December 28-30.
Medical Society of State of New York, Albany, January 25.
Western Surgical and Gynecological Assn., Omaha, December 20-21.

AMERICAN ACADEMY OF MEDICINE

Third Mid-Year Meeting held at New Haven, Conn., Nov. 11-12, 1909

CONFERENCE ON PREVENTION OF INFANT MORTALITY

(*Continued from page 2028*)

The Relation of Syphilis to Infant Mortality

DR. RICHARD A. URQUHART, Baltimore: Of all the grave consequences following on this one of the modern plagues, none are so serious as those of heredity. The high rate of infant mortality among the children of such parents is its greatest social danger. Many others, fortunate or unfortunate enough to survive its first effects, grow into a weakling childhood and manhood, a misery to themselves and a public charge. Few greater problems offer themselves to the philanthropist, to the social worker, the teacher and the state. The false position assumed toward social diseases by the authorities and the consequent ignorance of the far-reaching effect of such diseases is an everlasting disgrace to our modern civilization. It is high time that physicians, knowing its perils, force on the powers that be the right of the public to protection, as in the case of any other contagious disease. The details of the required laws and methods of making them efficient will work themselves out. It is not merely prohibiting a fool from his folly; frequently the innocent suffer; the state has to support weaklings, and racial degeneracy results.

DISCUSSION

DR. HELEN C. PUTNAM, Providence, R. I.: Syphilis should be placed among the reportable diseases.

DR. R. A. URQUHART: In view of the dread of publicity felt by persons suffering from syphilis, there is danger that they would not seek medical aid, and the result would be worse than if there were no report.

DR. J. MORTON HOWELL, Dayton, Ohio: One solution of the problem would be the introduction of courses of lectures by the medical inspectors into the curricula of boys in high schools.

The Curative Powers in Human Milk

DR. J. MADISON TAYLOR, Philadelphia: Scientific substitute infant feeding, primarily a boon, often proves a peril. Physicians are lulled into a false sense of security and too readily allow mothers to omit breast-feeding. Mothers, both rich and poor, too often assume that it is just as well to use the bottle, thus imperiling life and health, and especially right constitutional development. Sifting the evidence emphasizes (1) the well-known but inadequately realized fact that breast-feeding is of paramount value, not only as a food, but as contributing to prevention and cure of infectious and other diseases; and (2) the testimony from physiology as to the curative powers residing in the autoprotective qualities of the serum of milk, especially human milk.

Excessive Child-Bearing as a Factor in Infant Mortality

DR. ALICE HAMILTON, Chicago: This paper embodies the results of a statistical study of 160 families with regard to the number of children born and the number who died at birth, in infancy or in early childhood. The families selected were almost all from the poorer wage-earning class, the parents being foreign born in all but 3 per cent. Families with 6 children and over were placed in one group, those with 4 children and less than 4 in another group. The percentage of child mortality in the first group was over two and one-half times that in the second group. As the nationality, economic standing, mode of life and knowledge of infant hygiene was the same for the two groups, the explanation of this great mortality in the larger families lies probably in the insufficient care given to the over-numerous children and in the exhaustion of the mothers through excessive child-bearing. Grouped according to nationalities, the Jews show the lowest child death-rate, with the American-born next; the Italians the highest and the Germans, Irish and Slavs ranging in between in the order named.

DISCUSSION

DR. T. SMITH, Worcester, Mass.: I have made a study of the mortality among the wives of college graduates, Yale and Harvard graduates, going back 200 years, and have found that 33 per cent. died before they were 35 years old. I discovered also, in tracing out the records of some of the old New England families for a number of generations, that the large families seemed to tend to be extinguished by the fourth or fifth generation. For example, in one family, there were 20 children; 8 by the first wife and 12 by the second, but there are now no living descendants except through one son. In a second family of 10 children, the mother died at the age of 40. Of the 10 children, the 3 youngest were invalids; 2 lived to the age of 30; 8 married. Of these marriages there are only 3 descendants surviving.

The Waste of Infant Life

DR. EDWARD T. DEVINE, New York: It is sufficiently obvious that the enormous waste of infant life is a social problem of fundamental importance. Just how enormous the waste is we cannot exactly determine. It begins with the abortions and miscarriages which have been estimated to be the end of one pregnancy out of every five. It includes next the children born dead, though at full term, which happens, as nearly as we can tell, in about one case in twenty-eight. And the total is made up by the great numbers of babies born alive who die before they reach the age of 1 year. In New York one-seventh of all the babies born die before they are a year old, and their deaths make up between one-fifth and one-fourth of the total mortality. An encouraging decrease can be seen in New York in the last forty years. Between the decades 1866-75 and 1896-1905 the infant death-rate decreased 43 per cent., while the general death-rate decreased only 26 per cent. In spite of this decrease it is the opinion of the medical experts that a large part of the infant deaths which now take place are preventable. The social economist adopts the medical expert's opinion, and it is his part to devise means for preventing that part of the preventable waste which is due to adverse social conditions. "Prevention of infant mortality" is the subject of the conference, but that is not the ultimate object. The phrase is symbolic, suggestive, for the important thing is not merely to prevent babies from dying, but to keep them well and increase their strength, to give them the best possible beginnings for their lives. The efforts which give promise of the best and quickest returns are those which will decrease the proportion of premature and immature babies born, and will increase the proportion who are fed properly through their first year.

The Relation of Race to Infant Mortality

DR. RICHARD C. CABOT, Boston: This paper embodies the results of an examination of the vital statistics of Boston. Three thousand two hundred and ninety certificates of the board of health were studied for three wards of the city—one almost entirely Jewish, a second almost entirely Italian and a third almost entirely Irish. Excluding premature births and stillbirths, the infectious, diarrheal and digestive diseases make up about one-half of the total figures and the stillborn cases one-fifth; the premature and stillborn combined, about one-third. The mortality from pneumonia and tuberculosis represented more than two-thirds of the total mortality from all the infectious diseases reported to the board of health. In spite of the fact that the Jewish race is not supposed to be especially prone to alcoholism and syphilis, it was found that the proportion of stillbirths in Jewish families was 64 per 1,000 births; Italian, 41 per 1,000; Americans and Irish, lower. In birth accidents and in digestive diseases, the figures for the Jewish race were in the lead. The mortality from digestive diseases, excluding infectious diseases, was 54 per 1,000 births among the Jewish families; 35 per 1,000 among the Irish; 31 among Italians and 29 among Americans.

A Program for the Reduction of Infant Mortality in New York City

MR. ROBERT W. BRUÈRE, general agent of the New York Association for Improving the Conditions of the Poor: The problem of infant mortality in New York City is primarily a problem of poverty. This statement is based on the records of the New York Department of Health. The evolution of the campaign against infant mortality among the poor is illustrated by the work of the New York Association for Improving the Condition of the Poor. There are fresh-air pleasure parties at Sea Breeze, Coney Island. Sea Breeze has been partially changed from a picnic ground into a summer convalescent home and school for mothers. Summer district work has been started at Junior Sea Breeze in the heart of the city. All-year-round follow-up work has been inaugurated in connection with children's dispensaries, and infants' milk depots have been established by the New York Milk Committee. Impure milk and low wages are factors in determining the infant death-rate.

In view of the fact that 46 per cent. of the workers in New York receive less than $10 a week or $300 *per annum*, less than the sum given in the report of the Committee on the Standard of Living prepared by the New York Conference of Charities and Corrections and published by the Sage Foundation, as necessary to keep body and soul together, there should be a system of compulsory sick insurance, similar to that in practice in Germany. This insurance should be contributory; part provided out of the general taxation, and to a lesser extent out of the premiums paid by policy holders. The insurance should be compulsory for all persons with incomes less than $1,000 a year.

Educational Responsibilities of a Milk Depot

DR. IRA S. WILE, New York: The educational possibilities of a milk depot are the only limits to its educational responsibility. Its possibility is that of making milk depots unnecessary institutions. Its function should not be merely to supply a milk for infant feeding, but at least to teach mothers why it is supplied. Its responsibility is three-fold: to the infant, to the family, to the community. To the child the responsibility of the milk depot lies in attempting to supply a proper milk, i. e., its own mother's milk. An index of the value of a depot lies in the number of nursing mothers visiting it; not in the amount of modified milk sold. At each depot there should be a museum to exhibit all that relates to child hygiene from the prenatal period to the school period. To the family the depot is responsible for teaching the whole household how to keep the children well—not merely how to avoid letting them die. There should be classes for "little mothers" and expectant mothers, as well as for mothers with children. Toward the community the depot has the responsibility of developing mothers capable of bringing up their children to maturity, and of destroying the possible element of truth in the statement that children grow up in spite of their parents, not by means of them.

The Responsibilities of General Relief Agencies in Prevention of Infant Mortality

MR. SHERMAN C. KINGSLEY, superintendent of the United Charities of Chicago: The particular responsibility of relief agencies lies in the fact that their work is in the very homes where babies die in largest numbers. Our philanthropy and our municipal housekeeping ought to be brought to this test: Do they furnish conditions that are right for the baby? Where the white hearse goes most often, there you will find the weakest places in your municipal housekeeping. The charity organization society, or similar agency, is the natural agency to arouse public interest in the question of infant mortality in a city where it has received scanty attention. In such a place it will probably run afoul of the question of registration of births, of general insanitary conditions, of the problem of desertion, of the problem of the registration of midwives. There are also certain pressing and immediate responsibilities resting on charitable organizations in connection with their own special work: they should not send pregnant women to wash and scrub; they should make possible a reasonable period of convalescence after the baby is born; they should see to it that the family lives in rooms consistent with health for the baby; they should not encourage a mother to wean her baby in order to go back to work; they should see to it that the mother herself is properly nourished; they

should continue the visits of the nurse until the mother has profited by her instructions; they should be more patient in winning the confidence of the foreign mothers and teaching them. The conclusion of the whole matter may be suggested in the homely annals of one baby who died: begotten of a father who deserted before the baby came; born in an insanitary, three-room tenement house; attended by a midwife, who was unlicensed and ignorant; unrecorded in the city's book of births; suffered on account of feeding which was in accordance with the traditions of its mother and because she had to earn a living; died without ever having had a drink of water; furnished with a funeral that further impoverished the family.

Results of Philanthropic Experiments in Increasing and Decreasing Infant Mortality

DR. WOODS HUTCHINSON, New York: The progress of civilization has markedly diminished infant mortality, but not at so great a rate as other mortality. The institutional treatment of infants is almost entirely a failure. There is no place like home for growing live children. The chief causes of infant mortality are poverty with its children, ignorance and dirt. The cure is higher wages and shorter hours. Cheap food is usually deficient in nutritive value. Nursing mothers and children must have expensive foods. Any effort helping mothers to work instead of nursing their babies is a mistake. Prizes for large families are a mistake. The death-rate is high in families too large to be properly cared for.

Institutional Prevention of Infant Mortality

MR. HOMER FOLKS, secretary of the New York State Charities Aid Association: In institutions for providing a home for presumably well infants, mortality has always tended to be very high. Of 28,436 babies received at the St. Petersburgh Foundling Hospital, 24,272 died, 85 per cent. In such institutions mortality has been reduced, but is still excessively high, not more than 50 per cent. surviving among the best institutions. This is not from neglect. Artificial feeding kills babies in infant homes. Babies and their mothers should be kept together. Hospitals for sick babies are necessary and valuable.

Providing Situations for and Otherwise Assisting Homeless Mothers with Their Infants

MISS MARY R. MASON, agent of the Committee on Assisting and Providing Situations for Mothers with Infants, New York City: The death-rate is frequently from 90 to 100 per cent. when babies are separated from their mothers. Agencies find it entirely practicable to place women with babies in domestic service, chiefly in the country or small towns, with wholesome environment. Increasing stringency in the domestic service market increases desirable opportunities. The Philadelphia Society, 1908, placed 609 mothers. In 15 years the New York Agency has provided over 7,000 situations. Statistics are difficult to present, as the situation is usually only temporary (until father obtains work, or families are reconciled; many widowed or unmarried marry). In three years (1900-1902) of the mothers kept track of, four-fifths of the babies lived and were in good condition; one-fifth died or were in poor condition. Agencies need closer cooperation with maternity hospitals to induce mothers to keep, not abandon their babies; more temporary homes; more places for training incompetent mothers. The plan of keeping mothers and babies together is susceptible of much wider application.

DISCUSSION

MR. E. D. SOLENBERGER, Philadelphia, approved of the placing-out system, but recommended that a most careful and discriminating examination be made by the hospital physician of mother and child before sending out to a situation; and emphasized the need for greater cooperation between hospitals and similar institutions and the child-placing organizations. Statements of physicians and their recommendations as to the character of the work women were fitted to do, would be accepted by employers as authoritative, and would prevent them from giving too heavy manual work to women physically unable to perform such duties. Hospitals, on the other hand, would be more willing to care for a woman through a longer period of convalescence, knowing that the child-placing association would at the end of the time have a situation ready for the woman.

DR. J. H. MASON KNOX, JR., Baltimore, commended the placing-out system, but said that in view of the fact that a great many children are still being cared for in institutions legislation should be enacted which should secure adequate care, the necessary amount of air space and a sufficient number of attendants for the children now in institutions. He took exception to the statement that practically all infant mortality in institutions was due to artificial feeding. That this is only partially true, he said, is shown by the fact that among the wealthier classes only a small proportion of the artificially fed babies die when they have the proper food and the necessary care. There are hundreds of asylums in our large cities which are practically death traps, not primarily because they are asylums, but because they fail to do their whole duty to the child. Inadequate care, too few nurses, in many instances an inefficient nurse maid in charge of 20 or 30 babies, instead of a trained nurse caring for 3 babies; insufficient air space, large wards with 30 or 40 babies in one room, instead of 3 or 4 babies in separate quarters, he declared to be responsible for some of the excessive mortality in institutions. These are conditions, he said, not theories, and since there is no chance that institutional care can for the present be disregarded, he urged the insistence on remedial legislation by states and health departments to make the care more adequate to the recognized needs of the child.

The Care of Infants Apart from Their Mothers

DR. CHARLES P. PUTNAM, Boston: Foundling Hospitals are charitable in aim. The Massachusetts Infant Asylum may be used as an object lesson. For ten years it cared for all the state babies. One-half of the first 300 died. Babies are received no matter how ill. More complete investigation and cooperation by paid officers makes more admissions and sicker babies. Of the first 1,000 cases, 530 were legitimate, 470 were illegitimate and 69 were taken for adoption. No babies have been taken for adoption during the past 30 years. Of the first 1,000, 21 mothers deserted, but in the last 500 there were only 2 possible desertions. Of the first 2,000, 377 babies given away in adoption. Now the policy is quite opposite. Only those are admitted who do not properly belong elsewhere. The boarding-out system now requires the whole time of two trained nurses. Mothers are required to visit frequently. Parents and others must pay. 1. If mothers cannot be kept with babies, their interest must be kept with them. 2. This keeps as mothers' babies many that otherwise would be thrown on the public. 3. Many mothers who would have lost a bond to society now retain it.

The Care of Infants Who Must be Separated from Their Mothers Because of Some Especial Need on the Part of the Child

DR. EMELYN LINCOLN COOLIDGE, New York: It is a serious matter to separate a mother and her child, especially if the baby is breast-fed; but sometimes this is necessary if the mother is too poor and ignorant to care for the baby at home. Babies' hospitals are valuable for the treatment of infants who are very ill with some acute disease. If a baby cannot be nursed by its own mother and there is difficulty in feeding it artificially, it would be well to board the child with a reliable wet nurse who is under the control of a babies' hospital. Babies sick or well need individual treatment, as well as scientific and skilful care. There should be enough nurses in every hospital for babies so that they will have time to hold the patients, at least occasionally, giving them the individual attention which is many times their salvation. The patients in a babies' hospital should not only be looked on as "interesting cases," but as babies absolutely dependent on conscientious and tender care. Physicians and nurses who are to have the care of infants need special training in this particular branch of medicine. Those who graduate from a general hospital or college are not competent to assume the care of sick infants without first devoting considerable time to conscientious study of the diseases of infancy and childhood. In a babies' hospital small wards are desirable, ten or twelve beds in each ward being about the right number. If contagion then breaks

out the ward may be isolated and the disease checked at the start. Plenty of fresh air and sunlight must fill all the wards.

DISCUSSION

DR. H. J. GERSTENBERGER, Cleveland: An effort should be made in every city to have a babies' hospital, which should serve also as a school for the training of physicians, nurses and midwives, and which should offer post-graduate courses and furnish opportunity for research work.

DR. J. H. MASON KNOX, JR., Baltimore: I do not consider a preliminary examination of a child before admission to a ward sufficient; the plan of many hospitals of keeping a baby in a retention room, under careful supervision, for forty-eight or seventy-two hours before admitting to the general ward, is a more effective precautionary measure than the preliminary examination alone. In the placing-out system, there is great need for careful examination of mother and child before sending out to situations or into homes. In one case a family was persuaded to take a child which was supposed to be perfectly healthy. As a result, syphilis was contracted by two members of the family which befriended the child. Owing to the difficulty in diagnosing the disease in very young infants, until the lapse of six weeks or two months at least, the placing-out system, while excellent, should not go into effect until after a certain length of time, and not until the most careful laboratory and clinical diagnosis had been made. Speaking of the work of the milk stations, the importance should be emphasized of having not only trained nurses, but of having nurses especially trained in the care of children who would give their entire time, in connection with the work of the milk station, to babies and young children, and to the instruction of the mothers.

MRS. MARY KINCAID, New York, outlined the work of the *Delineator* in forming mothers' conferences, first in New York, and then throughout the country.

DR. ALBERT HALE, Bureau of American Republics, Washington, spoke of the methods by which the infant mortality in Buenos Aires, Argentina, has been reduced to such an extent that the city has one of the lowest infant death-rates in the world. The reduction was brought about largely by means of reforms instituted by the municipality, among them the control of the milk supply, the control of the water supply and the installation of a drainage system at a cost of $50,000,000. Another factor in the reduction of infant mortality is what is known as the *assistencia publica*, which maintains laboratories, and which is educational also.

Assisting Mothers in the Care of Sick Infants in Their Own Homes

MISS LILLIAN D. WALD, Nurses' Settlement, New York City: An important factor in lowered infant mortality is the skilled district nurse who gives serious nursing care in the homes viz.: The daily thorough bathing, the antiseptic care of mouth, nasal passage, eyes and external excretory organs; application of medical treatment, of hydrotherapy, dressings, etc.; who keeps records and makes observations, teaches the members of family how to ventilate, prepare diet, maintain the best available surroundings, and who secures the use of all necessary equipment and appliances for comfort of the patient. An illustration of the value of such service is given by the figures of the settlement of pneumonia and bronchitis in children whose ages ranged from 2 weeks to 2 years, these figures covering only three months' time. Total number cases pneumonia and bronchitis, 156, divided as follows: Lobar pneumonia, 64 patients (died, 9; sent to hospital, 4; cured, 51); bronchopneumonia, 84 patients (died, 6; sent to hospital, 24; cured, 54); pleuropneumonia, 8 patients (died, 2; sent to hospital, 6); bronchitis, 11 patients (sent to hospital, 2; cured, 9). During the same three months there were cases of intestinal disorder of various kinds, diarrhea, dysentery, enteritis, malnutrition, colitis, thrush, etc., etc., in children of the same ages. Total, 72 children: (sent to hospital, 11; died, 7; cured, 54). Hospital cases were usually complicated by some infectious disease. The pneumonia cases were in the large majority of cases of marked severity. Many of the intestinal cases also were serious and required most careful management.

(To be continued)

Book Notices

INFINITY OR NATURE'S GOD. By F. J. Duggan, M.D., Grand Forks, N. D. Flexible Leather. Pp. 136. Price, $1.50.

If the unconscious be the highest type of humor, then in this book we have something that will inevitably add to the gaiety of nations. Not that it is written with any such intent; the author takes himself and the universe far too seriously to be guilty of perpetrating a joke intentionally. The reader is informed in the preface that this work is "a prose composition, poetic in form and scientific in character." It was written "under the impulse of an irresistible influence" while the author was "in a pleasant semiconscious reverie." Still further to divide the parental responsibility for this epic, the author states that a "strange muse, whose promptings made the task easy" is really the being "who must, most assuredly, be held responsible for the existence of the poem." In closing the preface and foreseeing the effect that his verse may have on those whose mentality is not the most stable, the author expresses the hope "that detention hospitals may be established in every county in the land for the treatment of incipient insanity." The poem begins at the Beginning. Of the creation of matter we read:

> "Ever was and is to be," describes the situation.—
> The technical terms, wrongly used, were for elucidation.

Matter having been satisfactorily accounted for, a description of the natural forces seems rational. For instance, a tornado in the author's town:

> . . . . . sweeps down the street,
> With planks, chairs, and debris dancing on its spray four feet deep;
> Tin roofs, whole blocks of sidewalk are flying in the air,
> With small houses scattered to the wind my heart despairs.

Much havoc was wrought, apparently, for we read that there were

> Three killed, many injured, the train from off the track was blown;
> This certainly was the swiftest storm that ever I have known.

But it is when that mystery of mysteries—life—is touched on that the sublimest heights are reached.

> Who views the fishy tadpole would connect him with the frog,
> Anxious watching o'er his progeny while sitting on the log?
> Who sees the wriggling wiggler in the rain-barrel, ne'er at rest,
> Can see yellow fever and ague in the mosquito pest?

Nor is therapeutics forgotten; quinin is apostrophized thus:

> The parasite, the hematozoon at home in human blood,
> Is poisoned by the Jesuit-bark; it killed him where he stood.

These quotations must suffice. To analyze the entire work would require much time—and paper. As its author says, "it is readily seen the immense possibilities attending such a work." The book "was not written for remuneration" and must be read to be fully appreciated.

A TEXT-BOOK ON PRACTICAL OBSTETRICS. By Egbert H. Grandin, A.B., M.D., Gynecologist to the Columbus Hospital. With the Collaboration of George W. Jarman, M.D., Gynecologist to the General Memorial Hospital and Simon Marx, M.D., Late Surgeon to the New York Maternity Hospital. Edition 4. Cloth. Pp. 538, with illustrations. Price, $4.50. Philadelphia: F. A Davis Co., 1909.

This edition has been revised by Dr. Simon Marx. It aims at the greatest possible directness in the statement of clinical facts and omits all anatomic, embryologic and pathologic data that are not essential. It omits all literature reference and statistical data except such as are necessary to elucidate disputed facts. Brevity, accuracy and practicability, with the avoidance of theory and hobby, are the aims striven for by the authors.

These objects have been attained with a fair degree of success and the revision has much improved the book. Certain defects have escaped the reviser. In Chapter 4 the definitions and usage of the terms "presentation," "position" and "attitude" are confused and incorrect, as for example, when the position is said to be transverse or the attitude of the fetus is transverse or longitudinal. Figure A in Plate VIII, showing the method of making abdominal palpation at the pelvic brim, is incorrect. The hands should press into the sides so as to grasp the head or presenting part instead of pressing it back. On page 152, the definition of the pelvic outlet is mistakenly given for that of the "inferior strait." On page 154, in the description of the attachments of the levator ani, it is said that this muscle is attached to the lateral walls of the

vagina and to those of the bladder, a statement quite contrary to the fact. On page 159 it is correctly stated that "under normal conditions the head does not become perfectly flexed until the membranes have ruptured," then is added the obscure and incorrect statement "that is to say, descent does not begin." It is impossible to understand why Plates 23, 24 and 25, showing ungowned assistants and flexion maintained by the bare finger in the rectum, should be retained. Very few nurses would be willing to adopt the advice on page 244 to bathe the infant in water at the temperature of 80 to 90. The advised treatment of puerperal endometritis and metritis by thorough examination and intrauterine injections and curettage is opposed to the views of most modern teachers.

These faults should not disfigure a modern work on obstetrics. Their presence indicates too low an estimate of the critical demands of modern teachers of obstetrics. A greater thoroughness in the revision should have eliminated them and have left a book that would merit high commendation for its laudable aims and valuable contents.

RATIONAL IMMUNIZATION IN THE TREATMENT OF PULMONARY TUBERCULOSIS AND OTHER DISEASES. By E. C. Hort, B.A., B.S.C., M.R.C.P. Cloth. Pp. 75, with illustrations. Price, $1.50. New York: William Wood & Co., 1909.

The main motive in this publication of seventy-five pages appears to be the belief that those interested in immunization, particularly vaccine therapy, do not take into sufficient consideration the possibility that disturbed enzymic action of the body cells is responsible for much of the injury which attends infections. So far as can be gathered from the somewhat involved phraseology, the assumption appears to be made that in health the enzymes of the body are held in equilibrium by antienzymes, and that in infections this equilibrium is disturbed; that the antienzymes appear to be ineffective or deficient as a consequence of bacterial action; and that this state of affairs leaves the autolytic, and perhaps other enzymes free to injure the cells of the body. On the basis of this assumption, which the author appears to accept as a fact, he deplores that we do not immunize with enzymes and emulsions of the body cells as a means of causing the further formation of antienzymes, to the end that the pernicious action of the enzymes during infection may be antagonized.

After considering briefly the subject of vaccination with cultures of bacteria (hetero-inoculation) the subject of autoinoculation is discussed. Counter-irritation, Bier's methods, active and passive movements, light and heat, respiratory exercises, radium and x-rays, and high altitudes, are cited as means of producing autoinoculation artificially. In such procedures, Hort believes, the micro-organisms become more or less disseminated and stimulate the formation of antibodies.

The author prefers the method of autoinoculation whenever practicable, because, in addition to causing the formation of bacteriotropic substances, it also causes the production of those substances which inhibit the pernicious activities of the body ferments. The data cited to justify the latter conclusion are far from convincing in character. The unusual position is taken that the temperature curve is a measure of the process and extent of immunization. The opsonic index is considered as an unreliable indicator of the state of the patient's resistance.

In conclusion the author states: "Full conviction I can hardly hope to carry on the slender evidence here produced, but the attempt will not be fruitless if the attention of the makers of modern medicine be for the moment diverted to issues other than the merely bacterial."

OBSTETRICS. A Manual for Students and Practitioners. By David James Evans, M.D., Lecturer on Obstetrics and Diseases of Infancy, McGill University, Montreal, Canada. Second Edition. Cloth. Pp. 440, with 172 illustrations. Price, $2.25 net. Philadelphia: Lea and Febiger, 1909.

In this edition of Evans' "Obstetrics," several changes have been made and certain sections rewritten. The book is now one of the best of the smaller works on the subject; it is scientific and shows the mature judgment of a large and clear observation. The various subjects are presented in a concise manner with due regard to the relative importance of the various divisions.

In the presentation of some of the debated questions of obstetrics the author in a few instances adopts views that some would criticize as insufficiently established or antiquated. For example, Williams' classification of pernicious vomiting of pregnancy into toxemia and other forms which can be distinguished by the urine examination is hardly so well established as to form an indication for treatment of the former by such a radical method as the induction of abortion.

On the other hand no well-authenticated evidence authorizes attributing "congestion or engorgement" of the breasts to exposure to cold and hypersecretion of milk. The treatment of this condition with massage, the breast-pump and pressure bandage does not furnish as satisfactory results as the more simple and rational methods of support and the application of cold. The indication for abortive treatment of mastitis, to secure complete rest for the affected gland, would prohibit the use of the second method, namely, removal of the contents of the gland by means of massage and the breast-pump. So also the arrest of lactation by compression of the breast, purgation, and the restriction of fluids ingested, the use of massage and the breast pump and the application of glycerite of belladonna is not only pretty well-known to be unnecessary, but needlessly meddlesome and unpleasant, if not harmful.

AMERICAN PRACTICE OF SURGERY. A Complete System of the Science and Art of Surgery, by Representative Surgeons of the United States and Canada. Edited by Joseph D. Bryant, M.D., LL.D., and Albert H. Buck, M.D. Complete in Eight Volumes. Volume VI. Cloth. Pp. 916, with 624 text illustrations, and 39 plates. Price, $7. New York: William Wood & Co., 1909.

Volume 6 of this work, the previous volumes of which have already been mentioned in these pages, treats of "Prothesis in its Relation to Surgery of the Face, Mouth, Jaws and Nasal and Laryngeal Cavities," "Surgical Diseases and Wounds of the Nasal Cavities and Accessory Sinuses," "Surgical Diseases and Wounds of the Mouth, Tongue and Salivary Glands," "Surgical Diseases and Wounds of the Neck," "Surgical Diseases and Wounds of the Thyroid and Thymus," "Surgery of the Thorax and Spinal Column," "Surgical Diseases and Wounds of the Female Breast," "Surgical Diseases and Wounds of the Genitals and Vagina of the Female," "Surgical Diseases and Wounds of the Male Genital Organs," and "Chancroid, Gonorrheal Urethritis, Surgical Diseases and Wounds of the Jaw."

Some of the subjects are so comprehensively handled that the chapters amount to real monographs, thus making this volume of great value to the specialist as well as to the general surgeon. This is particularly true of the chapters on the surgical diseases and wounds of the nasal cavities and accessory sinuses. Great advances have been made during the past few years in the diagnosis and treatment of infections of the sinuses accessory to the nasal cavities, and the editors did well in allowing so much space to these important subjects.

The genitourinary surgeon likewise will find the subjects pertaining to his department very well presented. The publishers have maintained the same good standard of work as shown in the previous volumes.

A TEXT-BOOK OF SURGERY. By George Emerson Brewer, A.M., M.D., Professor of Clinical Surgery at the College of Physicians and Surgeons, Columbia University, New York. Second Edition. Cloth. Pp. 875, with 415 engravings and 14 plates in colors and monochrome. Price, $5. Philadelphia: Lea & Febiger, 1909.

Judging from the increased size of this book over the previous one, the author agreed with his critics that for a practical working text-book in surgery the brevity of the former edition was not commendable. In it the effort to condense was carried too far. Many important subjects were treated too briefly, and others were omitted. This fault has been remedied in the present edition. For instance, whereas only twenty lines were given to the subject of gangrene in the first edition, four pages are now devoted to it. Seven pages have been added to the chapter on tumors. The treatment of empyema is discussed far more fully than before. The same is true of many other subjects, so that the work can now be recommended as a really excellent text-book in surgery, standing midway between the brief manuals and the more

voluminous treatises. No attempt is made to discuss fully all improved methods of surgical treatment, but they are mentioned; one method, the one most in vogue, is given the preference in description. In one particular the book is open to criticism: when a drug is mentioned in connection with treatment, the dose is not given. In some instances this is a serious oversight. For example, in the treatment of aneurisms by means of the injection of gelatin, it is merely stated that the subcutaneous injection of a 1 per cent. solution of gelatin in normal salt solution is useful. Nothing is said as to the dose or as to whether the treatment is to be repeated. The chapter on anesthesia is brief but good. The chapters on surgical pathology are excellent, and the chapter on shock cannot fail to prove useful to both student and practitioner.

ATLAS OF EXTERNAL DISEASES OF THE EYE. By Dr. Richard Greeff, Professor of Ophthalmology in the University of Berlin and Chief of the Royal Ophthalmic Clinic in the Charité Hospital. Only Authorized English Translation by P. W. Shedd, M.D., New York. Half leather, with 54 plates and 84 figures in color. Pp. 135. Price, $10. New York: Rebman Co.

This is an almost literal translation from the text of Greeff's "Atlas der äusseren Augenkrankheit," and contains prints from the original plates illustrating that well-known work. While a careful comparison of the two atlases is not to the advantage of the American edition, either in type or paper, yet practitioners interested in external diseases of the ocular apparatus, but not familiar with German, will find in the English edition of Professor Greeff's works a most valuable aid in the diagnosis of those affections.

The German color-printer has faithfully portrayed the soft, almost indescribable, appearances of the diseased tissues—so difficult to present by any of the color schemes at our disposal. In this connection too much cannot be said commendatory of the remarkable fidelity with which the author, the sculptor (Herr Kolbow) and the optical firms (Mueller of Wiesbaden and Höning of Berlin) who supplied the artificial eyes for the models, and the printers have caught and fixed the pathologic alterations in such difficult subjects as eye patients. These illustrations, from the Berlin Pathoplastic Institute, are the best of their kind that have come to our notice.

By these means almost every ordinary and most of the rare diseases affecting the eyelids, the conjunctiva, the sclera, cornea, iris and lacrimal apparatus are portrayed, while many concurrent lesions on the face and head chiefly of dermatologic interest, are pictured.

A SYSTEM OF MEDICINE. By Many Writers. Edited by Sir Clifford Allbutt, K. C. B., M.A., M.D., LL.D., D.Sc., F.R.C.P., F.R.S., F.L.S., F.S.A., Regius Professor of Physic in the University of Cambridge, and Humphrey Davy Rolleston, M.A., M.D., F.R.C.P., Senior Physician, St. George's Hospital. Vol. VI, Diseases of the Heart and Blood-Vessels. Cloth. Pp. 844, with illustrations. Price, $1.50 net. New York: The Macmillan Co., 1909.

This volume is devoted entirely to a discussion of the diseases of the heart and blood-vessels. It contains nearly 850 pages, and the discussion of the subjects contained therein is full and complete. The first chapter, which is especially well worth reading, is devoted to a consideration of the physics of the circulation by Sherrington. It is a fitting introductory to the study of valvular lesions. Osler contributes a new article on Stokes-Adams disease. M'Crae has revised the original article by Dreschfeld on acute simple endocarditis. William H. Welch contributes the articles on thrombosis and embolism. There is little to criticize and much to commend in a work of this kind because it is complete. By no means the least of the valuable features of this book is the list of references appended to each article, although it is unfortunate that American medicine is mentioned so seldom.

THE PRACTITIONER'S VISITING LIST FOR 1910. Flexible leather. Wallet-shaped, with flap, pocket, calendar for two years and valuable data. Price, $1.25. Philadelphia: Lea & Febiger.

This visiting list is especially adapted to the wants of the general practitioner; it is well bound, compact, and contains matter well selected to give the puzzled doctor the hint that he needs. Doses and therapeutic reminders are given of which the physician should ordinarily be independent, but which he may occasionally find useful.

Medicolegal

Principles of Constitutional Law Governing Health Regulations —Board Enjoined from Sending Elderly Woman with Anesthetic Leprosy to Pesthouse—Personal Liability of Members of Health Board

The Supreme Court of South Carolina says, in the case of Mary V. Kirk vs. Wyman and others, constituting the Board of Health of the City of Aiken (65 S. E. R. 387), that the principles of constitutional law governing health regulations by statute and municipal ordinance may be thus stated:

First. Statutes and ordinances requiring the removal or destruction of property or the isolation of infected persons, when necessary for the protection of the public health, do not violate the constitutional guaranty of the right of enjoyment of liberty and property, because neither the right to liberty nor the right of property extends to the use of liberty or property to the injury of others.

Second. The creation by legislative authority of boards of health, with the discretion lodged in them of summary inquiry and action, is a reasonable exercise of the police power and the rules and resolutions within the scope of the authority of such boards have the force of legislative enactment. Legislative power lodged by the Constitution exclusively in the General Assembly is not delegated to such boards, but they are merely the agency for carrying out the legislative enactment.

Third. Arbitrary power over persons and property could not be conferred on a board of health, and no attempt is made in the Constitution or statutes to confer such power. On the contrary, it is implied in all such legislation that the board shall exercise the police power conferred in view of the constitutional guaranty that no person shall be deprived of life, liberty or property without due process of law, or be denied the equal protection of the laws. It is always implied that the power confererd to interfere with these personal rights is limited by public necessity. From this it follows that boards of health may not deprive any person of his property or his liberty, unless the deprivation is made to appear, by due inquiry, to be reasonably necessary to the public health; and such inquiry must include notice to the person whose property or liberty is involved, and the opportunity to him to be heard, unless the emergency appears to be so great that such notice and hearing could be had only at the peril of the public safety.

Fourth. To the end that personal liberty and property may be protected against invasion not essential to the public health—not required by public necessity—the regulations and proceedings of boards of health are subject to judicial review, by an action for damages or for injunction or other appropriate proceeding, according to the circumstances. In passing on such regulations and proceedings, the courts consider, first, whether interference with personal liberty or property was reasonably necessary to the public health, and second, if the means used and the extent of interference were reasonably necessary for accomplishment of the purpose to be attained.

Fifth. In exercising the jurisdiction to review the regulations and actions of such boards by injunction or other proceeding, the courts cannot invade the province of the legislative branch of the government. Inasmuch as it is the province of the legislative branch to determine what laws and regulations are necessary to the public health, statutes and regulations made, and measures taken under such statutes, and intended and adopted to that end, are not subject to judicial review; but the courts must determine whether there is any real relation between the preservation of the public health and the legislative enactment, or the regulations and proceedings of boards of health under authority of the statute. If the statute or the regulations made or the proceedings taken under it are not reasonably appropriate to the end in view, the necessity for curtailment of individual liberty, which is essential to the validity of such statutes and regulations and proceedings, is wanting, and the courts must declare them invalid, as violative of constitutional right.

Sixth. In all judicial inquiry, with respect to health laws and regulations, every intendment is to be allowed in favor of the validity of the statute and the lawfulness of the measures taken under it.

In this case it was admitted that Miss Kirk, who was not only a lady of refinement, highly esteemed in the community, but who was quite advanced in years, was afflicted with anesthetic leprosy contracted while engaged in missionary work in Brazil. The evidence furnished of the opinions of both specialists and general practitioners of medicine was quite full, and led to the conclusion that there was hardly any danger of contagion from Miss Kirk, except by touch, or at least close personal association. What was more important than these opinions was the uncontroverted fact that she had for many years lived in the city of Aiken, attended church services, taught in the Sunday school, mingled freely with the people in social life, resting on the opinion of a distinguished London specialist that her disease was not contagious, and in all that time there had been nothing to indicate that she had imparted the disease to any other person.

But while there was a strong showing that the anesthetic form of the disease was only slightly contagious, the court considers that when the distressing nature of the malady was regarded, it was manifest that the board was well within its duty in requiring the victim of it to be isolated. However, it does not think that there was any necessity to send such a patient to the pesthouse, which in this instance was a structure of four small rooms in a row, with no piazzas, used previously for the isolation of negroes with smallpox, situated within a hundred yards of the place where the trash of the city, except its offensive offal, was collected and burned. Nothing but necessity would justify the board of health in requiring even temporary isolation in such a place for an elderly lady, enfeebled by disease, and accustomed to the comforts of life, and the court thinks there was a strong prima facie showing that there was no good reason to conclude that such necessity existed.

For these reasons the court affirms a decree granting a temporary injunction restraining the board of health from removing Miss Kirk to the city hospital for infectious diseases, or pesthouse, the order containing the condition that it was not to be understood as interfering with the board of health in maintaining such quarantine regulations as they might deem necessary for the public safety. Still the court wishes it understood that it cannot too strongly emphasize the caution which courts should exercise in entertaining applications for injunction against boards of health.

The court agrees, it says, with the circuit judge, also, on the point that an action for damages against the members of the board of health as individuals would not afford Miss Kirk an adequate remedy. In some jurisdictions it has been held that the members of a board of health incur personal liability for a mistake in destroying property on the ground that it is dangerous, when in fact it is not. But in South Carolina it must be held, on the authority of White vs. City of Charleston, 2 Hill, 576, that the members of a board of health are not personally liable for errors in their official conduct, when they exercise their honest judgment. Personal liability depends on proof of bad faith. True, bad faith may be shown by evidence that the official action was so arbitrary and unreasonable that it could not have been taken in good faith. But if there were such showing, the remedy by action for damages would not be adequate where the health or life of the citizen is by force unnecessarily imperiled. Protection from the loss of health or life is the only adequate relief in such a case.

"Partial" Versus "General" Insanity as a Defense to Crime

The Supreme Court of Kansas holds, in the homicide case of State vs. Moore (102 Pac. R. 475), that, if the trial court see fit, it may recognize monomania, or so-called "partial insanity," as distinguished from "general insanity," when instructing the jury in a criminal case involving that form of mental derangement as a defense; but it is not imperative that it should do so, and, if the proper tests of criminal responsibility for the act in question be stated in the instructions, the substantial rights of the defendant are sufficiently protected.

To destroy criminality, monomania, or so-called "partial," as distinguished from "general insanity," must dethrone the reason and judgment to the extent the law requires with reference to the act which is the subject of prosecution. The verdict must always be determined by the quality of that act. That act is the product of "insanity," as the law defines that term, or not. The person committing it is either sane or insane for all purposes of the verdict and judgment.

It is true that the law recognizes every form of insanity or delusion which renders an accused mentally incapable of knowing the nature and quality of the act done, and that it was wrong; but it is also true that the law recognizes no form of insanity, although the mental faculties may be disordered or deranged, which will furnish one immunity from punishment for an act declared by law to be criminal, so long as the person committing the act had the capacity to know what he was doing and the power to know that his act was wrong.

Therefore the form or species of insanity with which it is claimed a defendant was affected is not, in the last analysis, material, and need not be discriminated in the instructions; and, if the proper test of criminal responsibility for the act in question be given, the substantial rights of the defendant have been protected. In some cases it might be helpful, and in others it might be confusing, to the jury, for the court to open up the subject of the various forms in which mental derangement may be manifested. The refusal to do so can scarcely ever be erroneous, if otherwise full and proper instructions be given.

Current Medical Literature

Medical Record, New York

December 4

1 *Fundamental Functions of the Muscle-Cells of the Cardiovascular System, With Suggestion of a Classification of Arterial Disorders. L. F. Bishop, New York.
2 Early Trephining for Severe Injuries of the Skull with Report of Patients Operated on. M. S. Kakels, New York.
3 Cancer of the Female Breast. J. N. Jackson, Kansas City, Mo.
4 Operative Treatment of Gonorrheal Epididymitis. F. R. Hagner, Washington, D. C.
5 Urinary Protein Resembling Bence-Jones Albumose: Clinical History and Post-Mortem Findings. J. E. Dale, Fort Collins, Colo.

1. Functions of Muscle Cells of Cardiovascular System.—Bishop says that cardiac muscle cells have retained some of the properties of nerve fibers. They have five sorts of properties, stimulus production, excitability, conductivity, contractility and tonicity. If supplied with appropriate nutriment the heart-muscle cells possess a power to secrete internally a material capable of causing contraction. This is stored up, and is exhausted by the beat. A specialization of function is necessary for the coordination of the heart action. Rest and proper nourishment are essential factors in heart treatment. The classification of arteriosclerosis is founded on the tonicity of the median coat. Hypertrophy of the media is the principal factor in many cases of atheroma and arteriosclerosis. Hypertonicity leads to sclerosis and hypertrophy of the media, and atheroma is apt to be engrafted on the diseased artery.

Boston Medical and Surgical Journal

November 25

6 *Diagnosis of Ulcer of the Duodenum. E. A. Codman, Boston.
7 Points in the Diagnosis of Injuries. F. J. Cotton, Boston.
8 *Variations in the Posterior Horn of the Lateral Ventricle. E. J. Curran, Boston.
9 Chemical Examination of the Feces of Infants and Children After Gastroenterostomy. F. B. Talbot, Boston.

December 2

10 *One Hundred Cesarean Sections Performed in the Boston Lying-In Hospital. C. M. Green, F. S. Newell, L. V. Friedman, N. R. Mason, J. R. Torbert and R. L. de Normandie, Boston.
11 Diagnosis of Ulcer of the Duodenum (continued). E. A. Codman, Boston.
12 Interstitial Pregnancy. F. W. Johnson, Boston.

6. Abstracted in THE JOURNAL, July 17, 1909, p. 226.

8. Variations in Posterior Horn of Lateral Ventricle.—Out of 64 adult brains, not specially chosen, examined by Curran, all

grades of variation were encountered, from the dilated ventricle of hydrocephalus internus to complete occlusions of the posterior horns, and these were numerous. In a large percentage of brains the tip of the posterior horn of the lateral ventricle is cut off from communication with the rest of the ventricle by a constriction and adhesions about the calcar avis. In many cases the adhesion of the walls is complete throughout the occipital lobe, making the so-called short horn. The ependyma, however, remains on the two adherent walls and can always be seen in this position, proving that this part at one time during development was occupied by the cavity which has since become obliterated. In many cases the tip of the posterior horn has a very narrow communication with the rest of the lateral ventricle, and, on account of the thinness of the wall about the calcar avis, any change in pressure is likely to close this aqueduct and produce a temporary disturbance in the circulation of cerebrospinal fluid, and might give rise to pain or other symptoms. Any of the above conditions would obstruct the circulation of cerebrospinal fluid. When the posterior horn is entirely or partially closed by adhesion of the walls, any increase of internal pressure would tend to break the adhesions and reestablish the normal posterior horn. Might not such straining on the adhesions, asks Curran, give rise to pain or other symptoms?

That the calcarine fissure and the cerebellum, which modify so much the shape of the posterior horn, are developing rapidly about the time of the appearance of convulsions in infants is an interesting coincidence. The large proportion of anomalies in the posterior horns of brains from institutions is significant. In all cases the ventricle should extend far into the occipital lobe, and traces of its having been there at one time during development are always to be found. The relationship of the optic radiation and other structures to the posterior horn are important facts for consideration in connection with the causes of temporary scotoma and migraine, and possibly other conditions. The condition of the posterior horn should be examined in all cases of obscure cerebral diseases or mental disorders.

10. **Cesarean Section.**—In general, the results in this series of 100 cases were as follows: Eight patients died, a mortality of 8 per cent. There were 43 primary operations in the series. One mother died, and one baby was lost. The cause of the maternal death was general peritonitis, probably due to some slip in the operative technic. One child died a few minutes after delivery after breathing well; the cause of death was congenital heart disease. One patient ran a moderate febrile temperature for the first few weeks after operation, but recovered without pelvic or other symptoms. In other words, among the primary operations there was one maternal and one fetal death, 2.3 per cent., and one patient who had an abnormal convalescence. Twenty-six cases were included in the secondary class. One mother died, on the eighth day following operation, of pyemia. At the time of operation it was known that she was a poor risk, as she was suffering from chronic nephritis, but the condition which demanded operation was an extreme degree of vaginal atresia following an old laceration, so that abdominal delivery was imperative. Two children died following delivery. One small, poorly developed child, the mother being a rachitic dwarf, died four hours after delivery, and the other died on the seventeenth day following delivery, of inanition.

The complications following operation were distinctly more marked in the secondary cases than in the primary. Three women suffered from phlebitis of one or both legs. One patient ran a febrile convalescence, but eventually recovered completely. In 3 cases the abdominal wound broke down and the convalescence was necessarily prolonged. In the secondary cases, then, we find a maternal mortality of approximately 4 per cent., and a fetal mortality of 8 per cent., while the complications which appeared during the convalescence were much more prominent than in the primary operation. In the late cases there were 31 operations. Among these there were 6 maternal deaths, approximately 19 per cent. The cause of death in all cases except one was general peritonitis. Five babies were lost, either being dead before operation was begun or dying shortly after delivery. Of the 6 mothers who died, 3 had been in labor twenty-four hours or more. In one, high forceps had been tried and failed. One patient was suffering from acute nephritis as a complication, and in one a sponge was left in the abdomen at the time of operation.

New York Medical Journal

December 4

13 Influence of Diet on Infantile Mortality. J. P. C. Griffith, Philadelphia.
14 *Immunizing Treatment of Hay Fever. W. Scheppegrell, New Orleans.
15 Resection of Five Feet of Intestine Following Thrombosis of the Mesentery. G. E. Shoemaker, Philadelphia.
16 Typhoid From the Surgical Point of View. A. E. Isaacs, New York.
17 *Amebic Enteritis with Uncinaria, Trichocephalus, and Trichomonads: Results of Treatment after Four Years. J. G. Gage, Ann Arbor, Mich.
18 Carcinoma in Early Life. H. T. Karsner, Philadelphia.
19 Fracture-Dislocation of the Spine. H. S. MacLean, Richmond, Va.
20 Management of a Cholera Campaign in the Philippines. A. J. McLaughlin, U. S. P. H. and M.-H. S.
21 *A New Artificial Leech. A. M. MacWhinnie, Seattle, Wash.

14. **Treatment of Hay Fever.**—In about 80 cases which Scheppegrell has observed, ragweed was the causal factor in every case except one, which was undoubtedly due to the goldenrod. The pollen of the ragweed is not simply a mechanical irritant, like dust, as is usually supposed, but it contains a pungent aromatic compound which acts as an irritant on the nasal mucosa. As a scientific basis for the prevention of hay fever, one must either cause the entire disappearance of the plant which produces the causative factor of the disease, or must artificially develop in patients susceptible to it that degree of tolerance which naturally exists in persons not suffering from hay fever. The former is neither possible nor practicable. The alternative, therefore, is the development of an artificial tolerance to the irritating pollen in persons subject to hay fever. Such a tolerance is gradually developed in the progress of the disease.

As the staminate flowers of the ragweed contain its pollen, these are made use of by Scheppegrell. At a period of time varying from two to six weeks the pollen of the staminate flowers are inhaled by the patient. These inhalations are at first made two or three times a day, and later, as the time of the usual development of the disease approaches, more frequently. The inhalation is followed by a slight attack of sneezing, some lachrymation, and a watery discharge from the nose, and then a congestion of the mucous membrane of the nostril. As no inflammation exists, these effects are not disagreeable or painful, and ordinarily pass off in the course of an hour. If the patient takes a walk or other form of exercise immediately after the application is made, the congestion of the mucous membrane is less marked. In a few days, the applications produce less reaction, and more pollen may be inhaled and the inhalations made a greater number of times. Gradually the reactions become less and finally are not observed by the patient. When this is the case the patient is immune to an attack of hay fever at this time.

This immunity, Scheppegrell finds, is not permanent, and therefore the treatment should not be discontinued until the regular advent of the hay-fever season, when it should be entirely discontinued, as the natural pollen of the air takes the place of the artificial inhalations. Scheppegrell believes that if the staminate inhalations are resumed after the cessation of the hay-fever period, a permanent tolerance will gradually be developed which will give the patient permanent immunity.

17. **Amebic Enteritis.**—The case reported by Gage was one of amebic dysentery of about two years' standing, and could not be considered a very promising one for treatment. The results show, however, that in some chronic cases the patients can be permanently cured by medical treatment, and they also illustrate the value of the ipecac treatment. The cure in this case is permanent, as shown by the freedom from symptoms in four years and the results of examinations of the stools. The character of the stools shows some intestinal indigestion, which may be the result of the former dysentery. The uncinariasis was very mild. There were only eight worms in the intestine, there was no distinct anemia, the eosinophilia was not marked, and there were no symptoms of the disease. The thymol treatment was successful in getting rid of all the worms. The trichomonads were evidently not greatly affected

by the thymol. They were present in the stools afterward, but apparently not as numerous. They were not present in the stools after the ipecac was given. The trichocephalus eggs were found on only one occasion and then only four. No worms were seen in the stools.

21. **New Artificial Leech.**—MacWhinnie uses a sterile artificial leech made of glass, which is so shaped as to show the exact amount of blood being extracted, and can be used at any particular point that is desired. It has three openings, the larger being for abstraction on the temple, while the smaller one on the same plane is made for attachment either with a large rubber bulb, or direct connection with a Pynchon pump. The large end has a diameter of 1¼ inches, and is adapted for the temple, cheek, or, in fact, any part of the face. The two small openings are arranged for the tragus, while the larger one may be used for the mastoid as well. When the surfaces are irregular the small opening is desired. Being of glass it can be sterilized, and its size is convenient. At the lower end of the bulb a cork is inserted which is removed when the proper amount of blood is obtained, and the whole instrument is then sterilized. No guess is needed as to whether the blood is being withdrawn or not, or in what amount. The artificial leech is first applied for several minutes to create a congestion, which will raise the part from 2 to 5 millimeters. Several small punctures are then made, preferably with a cataract knife. The artificial leech is then applied as described.

Lancet-Clinic, Cincinnati

November 27

22 *Burn which Involved One-half the Body Area; Recovery. A. H. Barkley, Lexington, Ky.
23 The Submerged Tonsil. W. Mithoefer, Cincinnati.
24 Abuse of the Obstetrical Forceps. J. O. Jenkins, Newport, Ky.

22. Abstracted in THE JOURNAL, Nov. 20, 1909, p. 1709.

Kentucky Medical Journal, Bowling Green

November 1

25 *Medical Organization and Work. I. A. Shirley, Winchester.
26 *Plea for the Surgery of Our Small Hospitals. J. L. Phythian, Newport.
27 *Prophylaxis in Medicine. C. G. Stephenson, Becknersville.
28 *Surgical Treatment of Cancer. A. J. Ochsner, Chicago.
29 Plea for the Protection of the Unborn Child in Kentucky. T. C. Holloway, Lexington.

November 15

30 Etiology, Pathology, and Symptomatology of Diabetes Mellitus. J. S. Lutz, Louisville.
31 Treatment of Diabetes Mellitus. J. B. Lukins, Louisville.
32 Control of Tuberculosis in Children. B. C. Frazier, Louisville.

25, 27, 28. Abstracted in THE JOURNAL, Nov. 27, 1909, pp. 1851, 1852, 1853.

26. Abstracted in THE JOURNAL, Nov. 13, 1909, p. 1651.

Journal of Experimental Medicine, Lancaster, Pa.

November

33 *Resistance to a Specific Hemolysin of Human Erythrocytes in Health and Disease. P. Rous, Baltimore.
34 Mechanism of the Reaction Between Bile Salts and Blood Serum and the Effect of Conjugation in the Formation of Bile Salts. A. W. Sellards, Baltimore.
35 *Influence of Thyroidectomy on Alimentary Glycosuria. J. McCurdy, Baltimore.
36 *Therapeutic Immunity Reaction in Differentiation of Trypanosome Species. B. T. Terry, New York.
37 *Parabiosis as a Test for Circulating Antibodies in Cancer. P. Rous, Baltimore.
38 *Phagocytic Immunity in Streptococcus Infections. J. C. Meakins, New York.
39 *Character of Protein Metabolism in Chronic Nephritis. P. A. Levene, L. Kristeller and D. Manson.

33. **Specific Hemolysin of Human Erythrocytes.**—Disease appears to change the resistance of red cells to specific hemolysin only in special cases. Of 41 cases of secondary anemia, 1 only showed a decrease. In 2 of 3 cases of pernicious anemia and in 2 cases of leucemia resistance was decreased also, and a decrease occurs sometimes in obstructive jaundice. An increase in resistance was seen in 2 cases of hemophilia and in 1 of chronic parenchymatous nephritis and in 1 of congenital icterus (Minkowski). The resistance of human corpuscles to hypotonic salt solution and to specific hemolysin are entirely independent of each other and the resistance to salt solution is much the more variable.

35. **Influence of Thyroidectomy on Alimentary Glycosuria.**—Removal of the thyroid glands causes a rise in the assimilation limit for dextrose, and if the parathyroids are left this result is permanent. The thyroids probably inhibit normally the direct combustion of the sugar in the muscles.

36. **Differentiation of Trypanosome Species.**—The experiments show that the guinea-pig is an unfavorable animal in which to preserve trypanosomes if the therapeutic immunity reaction is to be employed in the differentiation of trypanosome species, because trypanosomes of common origin which had not come in contact with medicaments of any sort behave like different species after having been passed through guinea-pigs for twelve months.

37. **Test for Circulating Antibodies in Cancer.**—The growth of adenocarcinoma in white rats was unaffected when the tumor animal was joined experimentally (parabiosis) with a resistant animal.

38. **Streptococcus Infections.**—In certain streptococcus infections, such as acute endocarditis and tonsillitis, there may be considerable increase in the opsonin for the streptococcus causing the infection and little or no increase for streptococci from other sources. Hence it is argued that but little benefit may be expected from the inoculation with bacteria killed by heat unless with streptococci causing the infection.

39. **Protein Metabolism in Chronic Nephritis.**—Results indicate that it may be important for dietetic-therapeutic purposes to establish the eliminating efficiency of the kidneys for nitrogenous substances.

Medical Herald, St. Joseph, Mo.

November

40 *Cancer a Constitutional Disease: Its Rational Treatment. J. E. Summers, Omaha, Neb.
41 Diseases of Metabolism as a Group. A. C. Croftan, Chicago.
42 Management of Enlarged Spleens. T. E. Potter, St. Joseph.

40. Abstracted in THE JOURNAL, Sept. 25, 1909, p. 1049.

Archives of Pediatrics, New York

November

43 Finkelstein's View of Infantile Alimentary Intoxication. I. M. Snow, Buffalo.
44 *Relation of Exercise to Adolescent Heart Development. W. L. Foster, Brooklyn.
45 Congenital Cyst of Liver. H. L. K. Shaw and A. W. Elting, Albany, N. Y.
46 Embryonal Adenosarcoma of the Kidney. M. Wollstein, New York.
47 *Investigations on the Irritating Effects of Cathartic Drugs. I. A. Abt, Chicago.
48 Cerebral Hemorrhage (Birth) with Operation. F. S. Meara and A. S. Taylor, New York.

44. **Exercise and Adolescent Heart Development.**—Foster claims that vigorous exercise is necessary for the boy at puberty to secure the normal heart development. During the training of athletics and in contests allowance should be made for the fact that the lesser muscular development of the prepubescent heart makes it unfit for prolonged violent exercise. Hearts of all school boys should be examined and suitable regulation of exercise suggested when necessary. No boys with heart murmurs should be allowed to indulge in the physical training work involving decidedly increased heart action or to enter any athletic contests.

47. Abstracted in THE JOURNAL, July 10, 1909, p. 140.

Yale Medical Journal, New Haven, Conn.

November

49 *Medical Aspect of Gastric Insufficiency. H. F. Stoll, Hartford, Conn.
50 Typhoid Spine. P. P. Swett, Hartford, Conn.
51 Cystoscopy: Its Technic and Diagnostic Uses. P. D. Littlejohn, New Haven.
52 *Dermatitis Following Local Application of Cow's Milk. H. M. Steele, New Haven.
53 *Ocular Evidences of Systemic Disease. M. H. Gill, Hartford, Conn.
54 *Partial Responsibility of the Insane. F. T. Simpson, Hartford, Conn.
55 *Hemolysis in Diagnosis of Malignant Neoplasms. H. S. Arnold, New Haven.

49. **Medical Aspect of Gastric Insufficiency.**—Stoll has found the following regimen to be satisfactory in these cases: Massage along the course of the colon before rising each morning; a glass of cold water before dressing; eat liberally of vegetables and fruits, especially stewed prunes and figs; drink two glasses of water between meals, and most important of all, have a regular time for going to stool whether the inclination is

present or not. The crouching position, as when a chamber is used, is sometimes of advantage, and colonic massage at that time is very efficacious. The food should be of a kind which leaves considerable residue in the intestine. Sour milk, buttermilk or cider may be drunk between meals and at bedtime. Agar-agar in amounts of from one-half to one ounce daily is effectual. Bran in place of breakfast food may be used, and a small amount of olive oil taken at meal times will very often be all that is required to insure a daily stool. Olive-oil injections given just before retiring are the most satisfactory means of obtaining a cure in very chronic cases; given at first every night; later, every other night, and so gradually make the interval longer until they are no longer required. With very weak abdominal muscles, exercises and electricity are indicated.

52. **Dermatitis Following Local Application of Cow's Milk.**—The rash in Steele's case occurred with perfect regularity, coming out about fifteen minutes after the milk touched the skin, lasting at first an hour, then gradually existing a shorter and shorter time until after twenty-one days it ceased to appear. In appearance it was a bright red blush, not raised, at times sharply circumscribed, at others with fading pink edges to normal skin. In extent it conformed quite closely to the area touched by the milk, either by running over the chin or cheek from the mouth or on the area to which milk was purposely applied. At no time did it resemble urticaria or cause apparent itching. With the exception of being a deeper red, it exactly imitated areas of skin often noted in babies where, for instance, the inner aspects of the knees have been pressed together for some considerable time during sleep, which on separation show a transient blush, lasting perhaps longer than the same condition in adults and being more brilliant in color.

53, 54, 55. Abstracted in THE JOURNAL, June 25, 1909, p. 2125.

Atlanta Journal-Record of Medicine

November

56 Etiology of Pellagra. R. T. Dorsey, Atlanta, Ga.
57 The Plea of Insanity and Some Pointed Tests. J. C. King, Atlanta.
58 Flatfoot and its Treatment. T. Toepel, Atlanta.
59 Symptomatology of Pellagra. E. C. Thrash, Atlanta.
60 Similarity in Symptoms of Pellagra, Leprosy and Tertiary Syphilis. C. M. Curtis, College Park, Ga.
61 Education and the Social Evil. A. W. Stirling, Atlanta.
62 Use of Fats in Tuberculosis. L. C. Roughlin, Atlanta.
63 Alveolar Pyorrhea and its Relation to Other Diseases. R. R. Adair, Atlanta.

Archives of Ophthalmology, New York

November

64 Extraction of Cataract in the Capsule. A. E. J. Lister, London, England.
65 Concretion in the Lower Canaliculus without Characteristic Signs; Concretion in the Upper Canaliculus. G. S. Derby, Boston.
66 Congenital Fistula of the Lachrymal Canaliculi. M. Carvill, Somerville, Mass.
67 Subconjunctival Cysticercus Cellulosæ. A. N. Alling, New Haven, Conn.
68 Hemorrhagic Central Chorioretinitis in Non-Myopic Eyes. C. J. Kipp, Newark, N. J.
69 *Differentiation of the Diphtheria Bacillus from Organisms Morphologically Similar. C. Fisher, Rochester, Minn.
70 Improved Apparatus for Localizing Foreign Bodies in the Eyeball by the Roentgen Rays. W. M. Sweet, Philadelphia.
71 Significance and Treatment of Traumatic Prolapse of the Iris. E. Gruening, New York.

69. **Differentiation of Diphtheria Bacillus.**—As the result of much experimental work, Fisher concludes that the diphtheria bacillus cannot be identified accurately by its morphology and its cultural characters alone. True diphtheria bacilli always ferment dextrin within forty-eight hours and never saccharose. This reaction, however, is not distinctive of the virulent bacillus diphtheria, since it is also given by certain non-pathogenic organisms, having the same morphology. Out of 13 unselected races which fermented dextrin, 5 were totally avirulent. Since bacilli which fail to ferment dextrin are much more commonly encountered, the fermentation test would, in the majority of cases, be conclusive. Practically, it is of little value on account of the necessity of obtaining the bacilli in absolutely pure culture. Animal inoculation is, at present, therefore, the only reliable practicable method of identifying the diphtheria bacillus. To exclude the virulent diphtheroids, a guinea-pig immunized with diphtheria antitoxin must be inoculated also.

Western Medical Review, Omaha

November

72 Army Sanitary Administration in the United States and Tropics. J. M. Banister, U. S. Army.
73 Senile Dementia. F. H. Kuegle, West Point, Neb.
74 Therapy of Rheumatism. L. Crummer, Omaha, Neb.
75 Hemorrhoids. S. W. Phifer, Wheatland, Wyo.

Journal of Infectious Diseases, Chicago

November

76 *Fecal Bacteria of Healthy Men. W. J. MacNeal, L. L. Latzer and J. E. Kerr, Urbana, Ill.
77 *Proportion of Granular and Barred Forms of *Bacillus Diphtheriæ* in Throat Cultures. O. T. Schultz, Cleveland, Ohio.
78 Bleeding to Death to Obtain Maximum Amount of Antidiphtheritic Serum from Horses. P. G. Heinemann and A. C. Hicks, Chicago.
79 *Use of Anhydrous Sodium Sulphite in the Preparation of Endo's Medium. J. H. Kastle and E. Elvove, Washington.
80 Experiments on Vaccination Against Rat Leprosy: Extraction of Rat Lepra Bacilli from Watery Emulsions by Chloroform. W. B. Wherry, Oakland, Cal.
81 Effect on Mice of Minute Doses of *B. Anthracis*. M. A. Barber, Kansas City, Kan.
82 *Effect of Reaction and of Certain Salts on Normal Opsonins. H. E. Eggers, Chicago.
83 Subacute Plague in Man Due to Ground Squirrel Infection. G. W. McCoy and W. B. Wherry, U. S. P. H. and M.-H. S.
84 *Pathology and Bacteriology of Plague in Squirrels. G. W. McCoy, U. S. P. H. and M.-H. S.
85 *Resistance of Human Erythrocytes to Cobra Venom. R. Weil, New York.

76. **Fecal Bacteria of Healthy Men.**—The number of fecal bacteria that grow on artificial media is only a small fraction of the bacteria microscopically visible in feces. In addition to the colon bacillus group, sporogenic aerobic bacilli and sporogenic anaerobic bacilli are normally present in human feces. *B. welchii* is normally present in the feces. It is to be noted, however, that the total number of sporogenic bacilli is much greater than indicated by the cultures, and there are a number of bacterial species in normal feces not yet cultivated.

77. **Bacillus Diphtheriæ in Throat Cultures.**—Granular forms of diphtheria bacillus in throat cultures appear to be increasing in frequency in Cleveland, whereas the barred forms have almost disappeared. The presence of these granular forms renders the distinction between genuine diphtheria bacillus and a granular non-pathogenic bacillus more difficult.

79. **Anhydrous Sodium Sulphite in Endo's Medium.**—Wherry was unable to arrest the progress of inoculation leprosy in a white rat by means of injections of rat lepra bacilli killed by heat. Injections of killed bacilli some days previous to the injection of living bacilli resulted in marked delay in the progress of the disease.

Leprosy tissue from a rat on being ground up with powdered glass and extracted with salt solution and then shaken up with commercial chloroform, the chloroform then being evaporated, gives a residue containing millions of bacilli free from all cellular elements and other bacteria. The method might be of assistance in detecting lepra bacilli in human cases.

82. **Effect of Salts on Normal Opsonins.**—The maximum opsonification occurs at the normal (alkaline) reaction of the serum, and any change of this reaction in either direction diminishes the opsonic effect. This result of altered reaction is due in large measure to its effect on the thermolabile element of the opsonin. Magnesium chlorid appears to stimulate phagocytic action of leucocytes.

83. **Subacute Plague in Man.**—The first case of undoubted squirrel plague in man which has come to autopsy in America is reported. The lesions were similar to those of subacute plague in guinea-pigs, rats and squirrels. The authors have not seen any lesions like those observed in this case—lobular pneumonia and multiple abscesses of the lymph nodes, lungs, liver and kidneys—in any other case of human plague.

84. **Plague in Squirrels.**—The commonest lesion of plague in the ground squirrel is a bubo and this may be the only one. There may be also purulent foci in the spleen, the liver, the lung and the kidney. Smears from purulent material fail to show pest bacilli in the majority of cases. The diagnosis was made by inoculation.

85. **Resistance of Human Erythrocytes.**—Weil has tested the resistance of human red corpuscles to a number of hemolytic agents, and of these agents cobra venom has given results of special interest. The condition which presents the most marked degree of resistance is syphilis after it has passed the

primary stage. Normal individuals and various diseased conditions give variable resistance within certain narrow limits, but this does not approach the degree of resistance characteristic of syphilis. The practical application of the reaction remains to be worked out. Theoretically, it is interesting because it illustrates a definite alteration in cells in response to an infection.

Journal Tennessee State Medical Association, Nashville

November

86 Congenital Calculus in Prostatic and Membranous Urethra of a Seven-Year Old Boy. W. D. Sumpter, Nashville.
87 Smallpox in Shelby County. N. F. Raines, Raines.
88 Treatment of Typhoid. J. T. Moore, Algood.
89 Diagnosis and Treatment of Eczema. J. M. King, Nashville.
90 The Neuroses. J. Lanski, Chattanooga.
91 Early Diagnosis of Gall-Stone Disease. J. E. Cannaday, Charleston, W. Va.

Journal of Cutaneous Diseases, New York

November

92 *Etiology of Psoriasis. S. Pollitzer, New York.
93 *The Parasitism of Psoriasis. J. F. Schamberg, Philadelphia.
94 *Idiopathic Multiple Hemorrhagic Sarcoma (Kaposi): Trauma an Etiologic Factor (?). D. Lieberthal, Chicago.

92. **Etiology of Psoriasis.**—According to Pollitzer, rheumatism, gout, neurosis and heredity are not direct etiologic factors in the production of psoriasis, but in the present state of our knowledge it can neither be denied nor affirmed that they may have some bearing on the obscure conditions of the system which render it more or less susceptible to this especial infection. Psoriasis is one member of a group of parakeratoses to which seborrhea corpis, and, in part, eczema seborrhœicum, belong, and is most probably due to an external microbic infectious agent.

93. **Parasitism of Psoriasis.**—Schamberg says that it might be argued that the failure to autoinoculate psoriasis in the vast majority of subjects,operates against the assumption that psoriasis is a local parasitic disease due to an exogenous organism. It might, furthermore, be argued that if the lesions of psoriasis are due to the implantation of a parasite on the skin of a susceptible individual, inoculation with lymph, blood and scales from a diseased patch on the healthy skin in the same patient might be reasonably expected to reproduce psoriasis lesions. Lack of knowledge, however, concerning possible conditions of immunity in this connection, makes it unwarranted to deduce any positive conclusions of the character indicated. The inability to autoinoculate psoriasis patients would not at all affect the hypothesis that psoriasis is a constitutional, infectious disease. From what has been stated, it is obvious that no definite conclusion as to the parasitism of psoriasis is warranted. The mode of growth and configuration of the patches, the occasional instances of apparent communication of the disease, and the Destot inoculation are arguments in favor of parasitism which cannot be decisively brushed aside. On the other hand, the general behavior of the disease, the common experience of observers as to absence of contagion and the almost uniform failure of inoculation experiments constitute strong evidence against parasitism.

94. **Multiple Hemorrhagic Sarcoma.**—This is the fourth case of this disease reported by Lieberthal. The three previous cases were reported in THE JOURNAL, Dec. 6, 1902, and Oct. 10, 1908.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Clinical lectures, single case reports and trials of new drugs and artificial foods are omitted unless of exceptional general interest.

British Medical Journal, London

November 20

1 Greek Medicine in Rome. T. C. Allbutt.
2 *Relation Between the Time of Rupture of the Fetal Membranes and Lacerations of the Cervix Uteri. S. Colyer.
3 A Short Criticism of the So-called Rational Puerperium. H. T. Hicks.
4 *The Blood-Tight Uterus and its Influence on Involution. C. N. Longridge.
5 Lymphangioplasty for Solid Edema. A. B. Mitchell.
6 Intestinal Obstruction from Traumatic Rupture of Blood-Vessel. R. Stewart.
7 Early Recognition and Treatment of Acute Intestinal Obstruction. J. Hartley.
8 *A Method of Intestinal Drainage. M. Mamourian.
9 Severe Eclampsia in Early Pregnancy: Recovery. A. S. Campbell.

2. **Laceration of Cervix Uteri.**—Colyer states that when the first stage of labor is normal, the presenting part descends into a dilated cervix by which it is not tightly grasped, and hence no lacerations are likely to ensue. But should it so happen that the membranes rupture before the end of the first stage, then the presenting part will descend into an incompletely dilated cervix by which it will be lightly grasped. In the latter case, second-stage pains will ensue, and the uterus will transmit a force to the presenting part, which will stretch the cervix at a rate in excess of its physiologic yielding power, and, as a rule, beyond its momentarily elastic limit, and thus lead to its laceration. The nearer the os approaches to full dilatation the greater will be the force exerted on it by the presenting part, because not only does the angle between the two become increasingly acute, but the pains will be stronger. It is not uncommon when the membranes rupture late to find that the presenting part is driven through an incompletely dilated cervix in one or two pains, thus proving how rapidly the stretching may take place. In those cases in which the membranes rupture early, we should not find lacerations of the cervix so common, for in them, as a rule, labor is slow until the cervix is sufficiently dilated to allow the presenting part to enter, and when it does enter the pains gradually change in character from those of the first stage to those of the second. In the second stage contraction and retraction of the longitudinal fibers become marked, and thus tend to draw up the cervix and lead to a more rapid dilatation of the os. But even with these compensations a slight rupture appears to occur in most cases.

4. **Blood-Tight Uterus and Involution.**—Physiologically, Longridge says, involution of the uterus may be considered as an acute autolytic degradation of the muscular tissue. It takes place in two stages, a rapid and a slow stage. The rapid stage differs from the slow, in that in the former the uterus is practically anemic and the reaction of the tissue is acid, whereas in the slow stage the reaction is alkaline and the blood is slowly percolating through the vessel walls. The transition from one stage to another is marked by an increased excretion of nitrogen.

8. **Intestinal Drainage.**—The method employed by Mamourian consists in utilizing the Murphy button with a piece of soft rubber tubing (about a yard or more long) as follows: A purse-string suture of silk is passed round one of the ends of the rubber tube, the male or female half of the button is introduced into the lumen and the thread tightened so as to grip the neck of the button. Next, a segment of the distended bowel is clamped and a linear purse-string suture inserted. The gut is incised, the other half of the button placed in position, and finally the two sections of the instrument united in the usual way. The anastomosis between bowel and rubber tube is complete, and on removing the clamp there is no leakage, and the fecal contents pass out of the tube into a jar containing some kind of deodorant well away from the area of operation. The purse string on the bowel need only be secured by a temporary knot so that the suture may be tightened and the incision instantaneously closed after the withdrawal of the button, the bowel being reclamped before the button is removed. If one opening does not give satisfactory drainage, the process can be repeated with as many coils as the surgeon desires, or a piece of drainage tubing can be passed up the soft tube through the button into the bowel and the intestines "milked" without the hands coming into contact with fecal matter.

This method is, perhaps, more serviceable in cases which require immediate colotomy. The Murphy button, this author considers, is superior to Paul's tubes, as its use involves no danger of detachment or leakage. The soft tube, with half the button in position being ready, the operation can be completed in a few minutes. The button, as a rule, remains *in situ*, affording good drainage for at least four days, during which time there is no necessity even to inspect the wound. When the button comes away the peritoneal cavity is completely shut off and the wound partially healed. The artificial anus thus made leaves nothing to be desired.

Lancet, London

November 20

10 Malaria in India. J. T. W. Leslie.
11 *Myotonia Atrophica. F. E. Batten.
12 Intestinal Obstruction in Which Double Resection of Intestine was Performed. H. M. Rigby.
13 *Streptococcal Infection in Eighty Consecutive Cases of Diphtheria. D. M. Mathieson.
14 Case of Thoracostomy for Heart Disease. A. Morison.
15 Kala-Azar in Madras, Especially its Connection with the Dog and the Bug (Conorrhinus). C. Donovan.
16 Acute Torsion of the Splenic Pedicle, Recovery after Splenectomy: Case of Floating Liver Cured by Operation. P. Patterson.

11. **Myotonia Atrophica.**—The leading features of this disease are summarized by Batten as follows: A patient, usually a male, between the twentieth and thirtieth year of life, begins to complain of weakness of the limbs and wasting of muscles. Some stiffness of muscles may also be complained of. On examination he is found to have weakness, and atrophy of the facial muscles, of the sternomastoids, of the flexors and extensors of the wrist, of the extensors of the leg or dorsiflexors of the foot, and the striking myotonic phenomenon that after grasping an object he has difficulty in relaxing his grasp. Pathologically, there is a general cirrhotic condition of the muscles, such as is found in muscular dystrophy. The spinal cord may show some degeneration in the posterior column, but the other portions of the nervous system are normal.

13. **Streptococcal Infection in Diphtheria.**—Mathieson records observations made in 80 consecutive cases of diphtheria admitted to the Infectious Disease Hospital, Leith. A bacteriologic examination of the throat of each patient was made on admission and at intervals during the stay in hospital, and the clinical progress was recorded. In 9 out of 80 cases a marked streptococcal infection of the throat was found at one time or other in the course of the disease. Out of these 9, 5 developed symptoms corresponding to those described by Sevester and Martin about the thirteenth day. In the remaining 71 patients in whom no streptococcal infection of the throat was at any time found, 2 showed epiphenomena about the thirteenth day. In other words: (a) 55 per cent. of the streptococcal cases developed "thirteenth-day" symptoms; and (b) 2.8 per cent. of the non-streptococcal cases developed these symptoms.

The following is a brief summary of the 7 cases in which "thirteenth-day" phenomena were observed: (a) Streptococcal cases: (1) punctate erythema + albuminuria; (2) sore throat + joint pains + rise in temperature (100.8 F.); (3) otorrhea; (4) punctate erythema; and (5) punctate erythema + rise of temperature (99.4 F.); (b) Non-streptococcal cases: (1) erythema multiforme; and (2) punctate erythema + rise of temperature (99.8 F.).

Medical Press and Circular, London

September 22

17 Decalcified Dietary in Arterial Atheroma. M. Loeper and X. Gouraud.
18 Adoption of Notification of Tuberculosis by Local Authorities. G. C. Trotter.
19 *How to Deal with the Quack Medicine Traffic. J. C. McWalter.
20 The Relation of Health to Industry. B. A. Whitelegge.

19. **Quack Medicine Traffic.**—According to McWalter, the solution of the quack medicine problem is simply this—that makers of the nostrums should be required to set forth the ingredients on the label. He says: This is practically the American remedy, but, after all, the problem in the United States has been very much like the problem with us; the results appear to be satisfactory, and we should not be too proud to follow a good example from a kindred people. Assuming that the disclosure of the ingredients is the remedy for the quack medicine trouble, how can we insist on it? An act of Parliament at once suggests itself, and would be the procedure if we had a minister of public health; but we have no such minister, and the difficulty of procuring such a bill might be insuperable. All the power and influence of our association has not been able to bring the new medical act into being, and if we cannot suppress open unqualified practice of medicine by law, we can scarcely hope to interfere with an insidious form of the evil which brings the treasury in 340,000 pounds a year. The indications for the treatment of the quack-medicine trouble are, then, to get statutory powers to insist that the ingredients be set forth on the label—and pending legislation to that effect to have the various medical officers of health to deal with the makers under the food and drugs act, with the help of the analytical records of the British Medical Association. The association might well help the campaign by other means—namely, by furnishing chemists with printed results of the analysis of the nostrums on which most of the public money is being spent at the moment. These should be sent out under the authority of the association, otherwise they would surely be questioned by the quacks. In addition to chemists, this might also be distributed to all doctors in the country, whether members of the association or not, as well as to the public analysts, sanitary authorities and the clergy.

Clinical Journal, London

November 3

21 Prognosis in Inflammatory Diseases of the Lungs and Pleura Commonly Treated Surgically. R. J. Godlee.
22 Retention of Menses. H. R. Andrews.

Practitioner, London

November

23 *Treatment of Inoperable Sarcoma by Bacterial Mixed Toxins. W. B. Coley.
24 Current Theories Regarding Arteriosclerosis: Symptoms. J. Cowan.
25 Ocular Manifestations of Arteriosclerosis. A. T. Ballantyne.
26 *Rheumatic Heart Disease in Children. J. W. Carr.
27 Acute Peritonitis. E. S. Bishop.
28 Indications for Operation in Tuberculosis of the Kidney. J. W. T. Walker.
29 *Intermittent Claudication. D. M. Greig.
30 Points in the Surgical Treatment of Goiter. T. P. Legg.
31 Treatment of Scarlatinal Otitis; with Special Reference to the Value of the Radical Mastoid Operation. A. K. Gordon.
32 Musculospiral Nerve Injury; Report of Two Cases. E. Harrison.
33 Mucous Colitis Considered as a Nervous Disease, with Special Reference to Treatment. F. Hernaman-Johnson.
34 A Rheumatic Toxemia. C. D. Musgrove.
35 Diseases of the Nervous System. H. C. Thomson.
36 Modern Assistancy. A. Sheperd.

23. **Treatment of Inoperable Sarcoma.**—Up to the present time Coley has had 52 cases of inoperable sarcoma successfully treated with the mixed toxins of erysipelas and *bacillus prodigiosus*. Of these, 35 patients have remained well from 3¼ to 16 years; 28 from 5 to 16 years; and 14 from 10 to 16 years.

26. **Rheumatic Heart Disease in Children.**—When a child is attacked by rheumatism, no matter in what form, it is comparatively exceptional for the heart to escape, while the whole brunt of the disease may fall on that organ, other evidences of rheumatism being either absent or so slight as to pass unnoticed. In other words, the heart is in early life the most vulnerable part of the body to the rheumatic poison. Moreover, when the joints escape, it by no means follows that the cardiac affection is likely to be slight; in fact, the reverse is often the case, and the poison seems to spend itself on the heart. In many of the most severe and intractable examples of rheumatic carditis which Carr has seen, joint affection has been conspicuous by its absence.

Another possible reason why the serious character of rheumatism in childhood is not sufficiently appreciated is, perhaps, because the cardiac lesion often seems at first so insignificant. Valvular disease in a child is a much more serious thing than in an adult because it interferes so materially with the nutrition of the growing tissues. Hence it is one of the wasting diseases of childhood, and when at all severe leads to marked stunting of growth, anemia and actual wasting; the rapid development at puberty imposes an especial strain on such children. The danger is greatest in cases of mitral obstruction, because the orifice becomes surrounded by a ring or curtain of fibrous tissue, which tends slowly to contract, like newly formed fibrous tissue in any other part of the body. Thus the orifice, instead of enlarging proportionately to the increased quantity of blood which has to pass through it as the body grows, may slowly become smaller, and to this extent, therefore, the lesion is progressive, although, as a rule, endocarditis due to rheumatism differs from that due to degeneration in tending to remain stationary when once the secondary results of the inflammation are complete. In children, when once the heart has been damaged, relapsing, subacute attacks of endocarditis and pericarditis and also of myocarditis, are prone to occur, often in the most insidious fash-

ion and quite independently of any obvious joint inflammation. Consequently they are very liable to be overlooked and are a common cause of irreparable damage to the heart.

The following are the evidences on which Carr chiefly relies in forming an opinion in these cases: 1. The presence of subcutaneous rheumatic nodules; (2) any pyrexia, especially in the evening; (3) joint pains; (4) any sudden development of, or increase in, anemia; (5) excessive and persistent rapidity of the pulse. The first and most essential point on which to insist in the treatment of such a case is the paramount importance of prolonged and complete rest. The child must not merely be kept in bed, but must remain absolutely recumbent for a period depending on the severity of the attack, but for not less than several weeks. During this time, the child should be kept on very light diet, for his bodily needs are reduced to a minimum, and it is desirable to avoid anything calculated to raise the arterial tension, and so throw additional strain on the left ventricle. Constipation is often very troublesome and most undesirable, so that laxatives must be given frely, as required. Great caution must be exercised in allowing the child increased freedom of movement, as very little exertion or excitement will markedly quicken the pulse and may even lead to a sharp rise in temperature. Sodium salicylate or aspirin, heart stimulants and the ice bag over the precordium are employed as occasion arises.

29. **Intermittent Claudication.**—Greig reports a case due to a venous, not an arterial, affection, which was followed by recovery.

Annals of Tropical Medicine and Parasitology, London

October

37 The Flagellates Occurring in the Intestine of *Glossina Palpalis* and in the Intestine and Proboscis of *G. Morsitans*. A. Kinghorn and R. E. Montgomery.
38 Human Trypanosomiasis in North-Eastern Rhodesia and Nyasaland: Second Report. A. Kinghorn and R. E. Montgomery.
39 Idem: Third Report. R. E. Montgomery and A. Kinghorn.

November

40 Sanitary Measures and Malaria Epidemics of Athens. J. Cardamatis.
41 An Account of a Form of Splenomegaly with Hepatic Cirrhosis, Endemic in Egypt. H. B. Day and A. R. Ferguson.
42 Biochemical and Therapeutic Studies on Trypanosomiasis. A. Breinl and M. Nierenstein.

Journal Laryngology, Rhinology and Otology, London

November

43 Treatment of Cicatricial Stenosis of the Larynx by the Methods of O'Dwyer and Rogers. D. B. Delavan.
44 Hughlings-Jackson-Mackenzie Syndrome. J. D. Lithgow.

Archives Générales de Chirurgie, Paris

October, III, No. 10, pp. 991-1100

45 *Hernia of the Ureter. (L'uretérocèle.) P. Caccia.
46 *End-Results of Operative Treatment of Mammary Cancer. (Résultats éloignés de l'ablation du sein pour cancer.) Fidelin.
47 *Operative Inoculations of Cancer. (Les inoculations opératoires du cancer.) F. Jacoulet.

45. **Ureterocele.**—Caccia warns that this rare condition should be suspected when a cord is found in a hernial sac. The diagnosis is made most readily in femoral hernia when access is obtained through the inguinal canal. He reports 2 cases and reviews the 22 which he has found on record and also 4 others in which an extraperitoneal cystocele was combined with the hernia of the ureter. A lipoma seems to be a frequent factor in dragging the ureter down in this way.

46. **History after Removal of Mammary Cancer.**—Fidelin's article is based on the experiences in five important French surgical clinics, the ultimate outcome being known in 234 cases of cancer of the breast, which he compares with others' statistics. A final cure is rare; recurrences are known twenty and thirty years after the operation without symptoms in the interim. An important lesson from his investigations is the benefit that may be derived from several successive operations in certain cases with multiple local recurrences. Life is prolonged, and the patient's courage maintained. The proportion of recurrences has dropped from 76 per cent. in 1865 to 25 per cent. by 1905 in certain large statistics, but the best technic to prevent recurrence is still undecided. Fidelin thinks that Handley's suggestions that the cancer spreads as a vine grows and that the technic should be based on this principle, certainly deserve attention.

47. **Inoculation of Cancer During its Removal.**—Jacoulet is convinced that study of operative inoculation will explain many cases of recurrence of cancer. The soil seems to be especially favorable for the development of cancer germs in certain patients. He has known of two unreported cases and reviews three others in which cancer of the tongue recurred from inoculation of cancer cells, by the instrument in some of the cases. The site, the size and the shape of the recurring nodule and the absence of recurrence in the scar, all point to inoculation by a solution of continuity in the mucosa, the result of application of the forceps to draw the tongue out, the recurring nodule developing at the point where the tongue was seized while the primary growth on the base of the tongue or roof of the mouth was being excised. In another case, the bistoury with which a cancerous gland had been cut out was used to make a vertical incision to liberate the lip drawn up too much by the suture after removal of an epithelioma on the lower lip. Several months later the patient returned with a recurring nodule at the point where the bistoury had been used first. The symmetrical incision was free from recurrence as the bistoury had been wiped free from contamination by the first incision.

Archives des Maladies du Cœur, etc., Paris

October II, No. 10, pp. 545-608

48 Digestive Enzymes (Protease and Lipase) of the Leucocytes. Their Properties and Importance in General Pathology. N. Fiessinger and P. L. Marie.
49 *Experimental Research on Functional Mitral Insufficiency. C. Lian.

49. **Experimental Mitral Insufficiency.**—Lian's research on dogs has confirmed the fact that dilatation of the left ventricle may entail functional mitral insufficiency revealed by a systolic souffle at the apex. It may subside and reappear, with the heart apparently normal in the intervals. The condition most liable to entail it is when extreme dilatation is accompanied by factors inducing simultaneous overexertion of the left heart and fatigue of the myocardium.

Bulletin de l'Académie de Médecine, Paris

November 2, LXXIII, No. 35, pp. 213-258

50 *Acceleration of Gaseous Interchanges and Organic Demineralization in the Pretuberculous and Tuberculous Condition. (L'accélération des échanges respiratoires et la déminéralisation organique chez les prétuberculeux et chez les phtisiques.) A. Robin.
51 Production of Heat by Living Beings and Influence of Food. (La production de la chaleur par les êtres vivants et la théorie de l'isodynamie alimentaire.) Weiss.
52 *Suprarenal Therapy. (Opothérapie surrénale.) E. Boinet.

50. **Early Differentiation of Tuberculosis.**—Robin's statements in regard to the increased intensity of the nutritional processes in the tuberculous are contrary to the generally accepted ideas as to the necessity for stimulating the biochemical processes in the tuberculous. He insists that treatment should be directed to retard instead of stimulating them, and presents here new arguments to sustain his position, among them a table showing the average consumption of oxygen and production of carbon dioxid in 24 healthy and 44 tuberculous individuals: 3.446 and 3.789 c.c. of oxygen being consumed in the healthy and 5.16 and 4.714 in the tuberculous, and 2.620 and 2.931 carbon dioxid produced in the healthy, and 3.785 and 3.569 in the 35 tuberculous men and 19 tuberculous women per kilogram of weight and per minute. The difference is still more striking in the tables that are computed per minute irrespective of the body weight. The difference grows constantly greater as the tuberculosis progresses, and this acceleration of the respiratory interchanges is frequently observed in the offspring of the tuberculous and also in alcoholism, in extreme fatigue from any cause, in worry and in all the predisposed. The "predisposition" to tuberculosis is thus seen to be a nutritional anomaly identical in all the predisposed and capable of being recognized and measured. Robin's further research has also confirmed the fact that the proportion between the inorganic residue of the urine and the total residue (in normal conditions 30 to 32 per cent.) is unusually large just preceding and during the first and second stages of tuberculosis, dropping below normal in the terminal stage. The bones of tuberculous individuals show abnormally small proportions of phosphoric acid, lime

and silica. The consumptive seems to drain the bones of the mineral elements to eliminate them in excessive proportions, while the tissues need these very elements to sustain them in their struggle against the tubercle bacillus. The points for diagnosis of the predisposition or early infection and for prognosis are thus: (1) increased production of carbon dioxid and consumption of oxygen; (2) organic demineralization; (3) reduction in the "coefficient of robustness" (estimated by Pignet by subtracting from the height the sum of the chest measure and weight. For example: height 1.69 meters, minus the chest measure 0.73 meters, plus the weight 82 kilograms, gives 14 as the *coefficient de robusticité.*); (4) abnormally rapid growth; (5) unusual thinness in proportion to the food ingested; (6) early fatigue; (7) long, narrow and shallow chest, small xiphoid angle, the ribs oblique, etc.; (8) exaggeration of the cutaneous radiation of heat; (9) sensation of internal heat, the average temperature generally above the average, and rapid rises of temperature; (10) abnormally small difference between the temperature in the axilla and the temperature of the skin elsewhere; (11) abnormally rapid rate of respiration and pulse; and (12) abnormally low arterial pressure. In the neurotic-gouty type, on the other hand, the pulse and respiration rate is abnormally low and the arterial blood pressure high, while the radiation of heat and the average temperature are below normal. It is thus possible, Robin declares, to recognize the pretuberculous and the incipient stages of tuberculosis and by appropriate measures to transform the soil and thus reenforce the natural defensive processes.

52. **Organotherapy of Suprarenal Disease.**—Boinet reports the postmortem findings in 44 cases of various suprarenal affections, all confirming the existence of a sclerous inflammation of the suprarenals in the syndrome of Addison's disease as also with mere bronzing of the skin and mucosæ and with the abnormal pigmentation sometimes observed in the tuberculous. In 20 other cases of sclerosis of the suprarenals, encountered in the course of 900 autopsies of adults at the Hotel Dieu, the diagnosis had been uncertain on account of the absence of pronounced bronzing. Suprarenal insufficiency is suggested by a combination of one or more circulatory disturbances (small unstable pulse, low arterial tension, the "white line" or track of pallor that follows when a blunt instrument is drawn along the abdominal wall, tachycardia and chilliness); digestive disturbances (anorexia, vomiting, diarrhea or constipation); toxic nervous disturbances resulting from irritation of the various nerve plexus around the suprarenal capsules, and general disturbances (anemia, emaciation, considerable and progressive amyotrophy). The diagnosis is confirmed by the benefit from organotherapy; benefit is also liable in cases of inoperable cancer in the suprarenals. He advises ingestion of sheep or calf suprarenal capsules fresh or desiccated in a vacuum, or subcutaneous injection of extract of the whole gland. The diagnosis may be facilitated by hastening the development of bronzing by measures for revulsion. Boinet's first communication on this subject was summarized in these columns Nov. 20, 1909, page 1743.

Lyon Médical, Lyons

September 2, XLI, No. 39, pp. 501-540

53 *Importance of Sterilizing Infants' Clothing. (Emploi des linges stérilisés chez le nourrisson.) E. Weill.

October 17, No. 42, pp. 633-688

54 *Treatment of Pulmonary Tuberculosis by Compression from Pneumothorax Artificially Induced. (Traitement de la tuberculose pulmonaire par la mise au repos du poumon au moyen de l'injection d'azote dans la cavité pleurale.) Balvay and Arcelin.

October 24, No. 43, pp. 689-728

55 Acute and Curable Form of Tic Douloureux of the Face. M. Lannois.

53. **Importance of Sterilizing Infants' Clothing.**—Weill has found that the steam laundry cannot be relied on to render infants' diapers and other clothing absolutely sterile. They are liable to acquire germs even on their passage from the laundry to the infant. From a nurse's apron, fresh from a steam laundry in the building, streptococci, staphylococci, diplococci and other germs were cultivated, as also diplococci and bacilli from an infant's cap, laundered and kept two days in the ward linen closet. Weill now insists on having the infants' clothing sterilized by steam under pressure for twenty minutes, the clothing sorted out into sets after laundering, placed in bags and sterilized and kept in the bags until used. One bag contains the inner garments, another the slips and caps; a third, a complete outfit for one infant, and a fourth the gauze sponges used in washing the child. These bags are sterilized and not opened till needed. The bag with the complete outfit is hung on the bedstead, to be used in a hurry at need; the other bags are kept in the linen closet. The nurses are trained never to let their hands come in contact with the part of the linen that comes next the infant's skin. The infant is washed with the gauze sponges taken from the bag, dipped in boiled water, and a little sterilized olive oil poured on them. The nurse's hands are scrubbed and dipped in bichlorid solution before she takes anything out of the bag; she then closes the bag or metal box again at once. The diapers are changed as soon as they are wet. When a bed is vacated, the mattress is disinfected and the iron singed with alcohol. When steam disinfection is not practicable, he has the linen moistened well and ironed till dry. On introducing these strict measures, the mortality in his service dropped from 41.87 per cent. in 1901 to 26.7 per cent. in 1903 and it has been declining since, while the number of cases of acquired cutaneous affections has dropped almost to zero. The infants are all in the same ward, but he tries to keep those with skin diseases at one end of the ward, with separate nurses, and all the nurses are trained to wash their hands with a bichlorid solution before feeding or changing the diaper of an infant. Each child has its own rubber blanket, washed in bichlorid solution each morning; this is spread over a pillow and the infant is placed on it for the physician's inspection. But these precautions failed to ward off infection until the linen was systematically sterilized, when all trouble from this source ceased at once. Not only in prophylaxis but in promoting the healing of cutaneous lesions the sterilized linen has had a good effect. The skin of an infant, he declares, is so sensitive and receptive that it should be regarded and treated just like an open wound. It should be kept covered up, dry and aseptic, while it obeys its inherent tendency to spontaneous anatomic and physiologic repair. This article was presented at the recent international medical congress at Budapest.

54. **Immobilization of Lung by Injection of Nitrogen.**—Balvay and Arcelin have applied this method of treatment in several cases of open tuberculosis and have obtained good results. They injected at first 400 c.c. of nitrogen, repeating the injection four days later with 1,000 c.c., reinjecting about the same amount at similar intervals until the lung was completely immobilized. The pleura absorbs daily from 50 to 80 c.c. of the gas. The febrile temperature drops to normal almost at once, and in the afebrile cases there is no longer a rise of temperature on moderate exertion. By renewing the injection before each menstrual period, it proved possible to render it afebrile in patients who had fever usually at this time. The cough was increased at first after the injections, inducing expectoration. Benefit was observed only in the unilateral cases, however; when both lungs were involved the process in the non-compressed lung became rapidly aggravated, but laryngeal complications were no contraindication. Syncope occurred sometimes in patients with unusually small hearts, but never otherwise. One very anemic patient with multiple lesions and abnormally small heart, died in syncope a few days after a single tentative injection of 500 c.c. of the nitrogen. The principal advantage of the treatment is the way in which it drains the lung and favors cicatrization while preventing secondary infection from inhaled germs and congestion liable to entail hemoptysis.

Presse Médicale, Paris

October 27, XVII, No. 86, pp. 753-760

56 *Treatment of Nephritis with Serum from Renal Vein. P. Spillmann and J. Parisot.

October 30, No. 87, pp. 761-776

57 Dust in Transmission of Tuberculosis. (Contagion de la tuberculose par les poussières sèches.) P. Le Noir and J. Camus.

58 The Generally Disregarded Organic Elements in the Urine in Diabetics. (L'indosé urinaire chez les diabétiques.) H. Labbé and G. Vitry.

59 Adherence of Molecules and Its Importance in Various Biologic Phenomena. (Etude de l'adhésion moléculaire et de son intervention dans divers phénomènes biologiques.) M. Mayer.

56. **Treatment of Nephritis with Serum from the Renal Vein.**—Spillmann reviews the evidence that has been accumulating in the last few years in regard to the efficacy of treatment of nephritis with the internal secretion of the kidney as obtained from the blood issuing out of the organ, in the renal vein. He here reports in addition careful research on a number of patients under this treatment, recording day by day the metabolic findings, etc. Goat serum was used, taken from the renal vein, and from 10 to 50 c.c. was the usual dose. The action of the treatment seems to be about the same as that of ordinary organotherapy and the indications are the same for each, that is, conditions suggesting insufficiency of the kidneys. The effect is prompter and more pronounced the milder the kidney affection. The specific effect is seen instructively when the serum is injected into healthy persons, the amount of urine and proportion of chlorids eliminated increasing notably under its influence. His cases included 4 patients with acute and 6 with chronic nephritis, uremic coma or nephritis from corrosive sublimate poisoning in 1 case each, and 2 patients with an intercurrent kidney lesion during pneumonia. Under the influence of the injections the diuresis increased to 6, 8 and even 10 liters during the twenty-four hours; the edema and dyspnea subsided and the heart was markedly relieved. The effect was evidently the result of a specific stimulating action on the kidneys, far more effectual than ordinary diuretics, and effective in many cases in which no benefit was apparent from the latter.

Semaine Médicale, Paris

November 10, XXIX, No. 45, pp. 531-540

60 *Median Suprahyoid Phlegmons. F. Lejars.

60. **Phlegmon Below the Floor of the Mouth.**—Lejars has encountered a number of cases of severe diffuse phlegmon in the floor of the mouth, sometimes pushing up the tongue and sometimes only discoverable by palpation with one finger in the mouth and the other under the chin. At first he treated them by incising in the floor of the mouth but found that this did not reach the root of the evil, while a median incision under the chin, above the hyoid bone, answered the desired purpose most effectually, incising from the tip of the chin nearly to the hyoid bone. He does not wait for pus to collect, the rapid swelling and its extension testifying to the gravity of the infection. The greatest danger is from half measures and delay, and he cites one case in a vigorous man of 65. The swelling was not very pronounced and there was little pain and fever. As the general condition continued good nothing was done for several days, and then a little blood was evacuated through an incision through the floor of the mouth; no pus was discovered but some relief followed. The swelling kept up, however, until the entire chin was involved. The actual cautery was applied and a little pus and serous fluid escaped. Considerable relief followed for two days, but then the tumefaction spread on both sides and an incision showed considerable destruction from the infectious phlegmon and the patient soon succumbed. All this would probably have been averted if the focus had been opened from below in time and amply drained. An incision in the mouth is adequate only when the abscess is circumscribed and, protruding into the mouth, is thus easily accessible.

Berliner klinische Wochenschrift

November 1, XLVI, No. 44, pp. 1965-2004

61 *Chlorinated Lime in Dermatology. (Anwendung des Chlorkalks in der Dermatologie.) C. Binz.
62 Quantitative Determination of Inhibiting Body in the Wassermann Reaction. (Quantitative Hemmungskörperbestimmung bei der Wassermann'schen Reaktion.) J. Zeissler.
63 *Derangement of Suprarenal Functioning in Infectious Diseases. (Störung der Nebennierenfunktion bei Infektionskrankheiten.) F. Lucksch.
64 *Importance of Bronchoscopy for Internal Medicine. A. Ephraim. Commenced in No. 43.

November 8, No. 45, pp. 2005-2044

65 *Early Operation in Appendicitis. (Die Frühoperation bei Appendicitis.) E. Sonnenburg.
66 Cholera Not a Nitrous-Acid Intoxication. (Ist die Choleraerkrankung eine Nitritvergiftung?) A. A. H. van den Bergh and A. Grutterink.
67 Decline in Tuberculosis Mortality. (Weitere Mitteilungen zur Abnahme der Tuberkulosesterblichkeit.) B. Fränkel.
68 Allowing Parturients to Get Up Early. (Frühaufstehen der Wöchnerinnen.) R. Müllerheim.
69 *Serodiagnosis of Syphilis of the Aorta. (Ueber die Wassermann'sche Reaktion bei Aortenerkrankungen und die Bedeutung der provokatorischen Quecksilberbehandlung für die serologische Diagnose der Lues.) K. Donath.

61. **Bleaching Powder in Dermatology.**—Binz reports further success from the method of treating chilblains with chlorinated lime, mixed with 9 parts of paraffin ointment, and he here reviews Ehrenberg's application of this treatment in 15 cases of intractable erysipelas. He advises commencing with a 5 per cent. ointment at first, applying it once a day, gently, to a small part of the focus, then increasing to 10 per cent. if there is no idiosyncrasy. Sodium thiosulphate may be used in a 1 to 1,000 solution to rinse off the chlorin, if required. No by-effects were observed in the 15 erysipelas cases except injury of the linen if the part was not sufficiently protected.

63. **Disturbances of Suprarenal Functioning in Infectious Diseases.**—Lucksch reports experimental research which confirms his assumption that defective or lacking suprarenal functioning is an important factor in infectious diseases. The injurious influence of the infectious toxins on the chromaffin system should be borne in mind, and the advisability of giving adrenalin to combat the diminishing blood-pressure should be considered.

64. **Bronchoscopy in Internal Medicine.**—Ephraim has found bronchoscopy useful in 95 cases in revealing the cause for the puzzling phenomena observed. In some cases a varix in the trachea explained hemoptysis and permitted a cure. In one case a syphilitic tumor was discovered as the cause of a peculiar cough and the patient was promptly cured. Killian once found and removed a sarcoma in the lower third of the trachea which had caused no symptoms except recurring hemoptysis. Anesthesia is not required for bronchoscopy unless possibly in children.

65. Address at the recent International Medical Congress at Budapest.

69. **Mercurial Test in Serodiagnosis of Syphilis.**—Donath reports a positive serodiagnosis in 85.3 per cent. of 27 cases of pure aortic insufficiency, mesaortitis, or aneurism. Among the 27 cases were 3 in which there was a history of articular rheumatism, but the features of the joint affection showed that it must have been of syphilitic nature rather than true rheumatic polyarthritis. The gummatous form of syphilitic synovitis and ostitis may be accompanied with disturbances suggesting rheumatism. The aortic affection in these cases had previously been regarded as the consequence of infectious articular rheumatism, and in 4 other cases abuse of tobacco and in 2 abuse of alcohol suggested the toxic form of mesaortitis until the serodiagnosis gave the clue. In many patients suspected of syphilis but giving a negative reaction, it is possible to transform the negative into a positive response by a tentative brief course of mercury. He calls this the "provocatory mercurial treatment." After inunction of 12 gm. of gray ointment during the week the Wassermann reaction became positive. This is similar to what is observed in chronic malaria when small doses of quinin may induce an acute phase of the disease.

Deutsche medizinische Wochenschrift, Berlin

November 4, XXXV, No. 44, pp. 1905-1952

70 *Diagnosis and Treatment of Tumors in Spinal Canal. (Geschwülste innerhalb des Wirbelkanals.) H. Oppenheim.
71 *Pathology and Treatment of Sympathetic Ophthalmia. C. Horstmann.
72 *Serodiagnosis in Syphilitic Eye Lesions. (Serodiagnose der Syphilis in der Augenheilkunde.) G. Schumacher.
73 *Relations Between Tuberculosis and Syphilis in Eye Lesions. (Beziehungen der Tuberkulose zur Syphilis bei Augenleiden.) Id.
74 *Tumor in Frontal Sinus. (Zur Kasuistik der Stirnhöhlengeschwülste.) R. Herzenberg.
75 Seroreaction in Leprosy with Syphilis Antigen. (Komplementablenkung bei Lepra mit syphilitischem Antigen.) J. Eliasberg.
76 Non-Reliability of Blood-Pressure in Prognosis of Diphtheria. (Prognostische Bedeutung des Blutdrucks bei der Diphtherie.) M. Brückner.
77 Tuberculosis in Infants. (Zur Klinik der Säuglingstuberkulose.) K. Mallinckrodt.
78 *Correction of Stiff Hip Joint. (Zur Mobilisierung ankylosierter Hüftgelenke.) O. Meyer.

70. **Intraspinal Tumors.**—Oppenheim has been able to cure 13 out of 25 patients with tumors in the spinal canal, thus restoring 52 per cent. to comparative health, including 40 per cent. in which the cure may be called complete. From helpless paralytic cripples they have been restored to active life; one young woman has married since. In 6 of these more favorable cases, the tumor was in the dorsal, in 4 in the cervical, and in 1 in the lumbar region, and in 2 in the cauda equina. He operates even when he is unable to determine the exact location of the tumor within a few segments, as by intradural probing above or below it is possible to disclose the tumor. When the location is very uncertain, it may be wise to wait until the anesthesia has reached a constant upper level, the patient being kept under constant supervision. If the diagnosis wavers between a tumor, circumscribed spinal serous meningitis and hypertrophic pachymeningitis, laminectomy is indicated for all if antisyphilitic treatment affords no relief. He does not advocate surgical intervention on tumors in the spinal cord itself, although benefit may be derived from laminectomy and slitting the dura to give the growth more room.

71. **Sympathetic Ophthalmia.**—Horstmann advises prompt enucleation in prophylaxis of sympathetic inflammation, as no other measures guarantee against it.

72-73. **Serodiagnosis in Syphilitic Eye Affections.**—Schumacher reports examination of 215 ophthalmologic patients and emphasizes the value of the Wassermann test for differentiation, although a positive reaction is rare with inherited syphilis free from recent acute symptoms. His research shows that tuberculosis may develop in the internal eye on the basis of some anomaly due to inherited syphilis. In some cases general tuberculin treatment should be combined with the ordinary antisyphilitic measures. The latter alone suffice when the tuberculous process is latent, but when the syphilis is latent and the tuberculosis manifest, both should be treated to increase the resisting power of the organism and thus render conditions unfavorable for the progress of the tuberculosis.

74. **Tumor of the Frontal Sinus.**—Herzenberg's patient was a man of 56 with a cystic tumor for fifteen years, for which he refused operation until it measured 38 by 35 cm. An incision released 1,800 gm. of a reddish brownish fluid and the brain was found much compressed, while the bone had been worn away. The case is remarkable from the absence of brain symptoms and of pain or other sensation except the discomfort from the large tumor, although after its removal there was room for the fist between the skull and the brain.

78. **Mobilization of Ankylosed Joints.**—Meyer expatiates on the fine results to be attained by excision of part of the joint and interposition of a flap consisting of fat tissue and a thin layer of muscle, fastened with silk sutures to form a cushion between the two bones. He gives a detailed account of a case of ankylosis of the hip joint in which application of this technic restored a cripple to active life. The patient was a woman of 38, with kyphosis from spondylitis in childhood; the coxitis entailing the ankylosis had healed about the age of 14.

Münchener medizinische Wochenschrift

November 2, LVI, No. 44, pp. 2249-2296

79 *Experimental Research on the Growing Eye. (Versuche am wachsenden Auge.) K. Wessely.
80 Acquired Diverticula of the Appendix. (Zur Pathologie und Klinik der erworbenen Wurmfortsatzdivertikel.) G. E. Konjetzny.
81 Antitrypsin Content of Blood Serum in Mental Derangement. (Ueber Antitrypsingehalt des Blutserums bei Geisteskranken.) Jach.
82 The Cerebrospinal Fluid in Experimental Trypanosomiasis. (Untersuchungen des Liquor cerebrospinalis auf Vermehrung der Zellelemente und Eiweisskörper bei Trypanosomiasis der Hunde.) F. Apelt.
83 A Diplococcus Epidemic Resembling Influenza. C. Rose.
84 Electrocardiograms of Irregular Heart Action. (Die Arythmie des Herzens im Elektrokardiogramm.) A. Hoffmann.
85 *Primary Pyelitis. L. Saathoff.
86 *Successful Serotherapy of Severe Tetanus. L. Simon.
87 *"Tuberculin Vaselin" for the Ocular Diagnostic Reaction. (Modifikation der Konjunktivalprobe für die Praxis.) A. Wolff-Eisner.
88 Improved Roentgen-Ray Technic. F. Dessauer and B. Wiesner.
89 Mobility of the Corpuscles in Vaccine and Smallpox. (Ueber die Beweglichkeit der Körperchen der Vakzine und der Pocken.) G. Volpino.
90 Fitness for Military Service of German Recruits. (Zur Frage der Militärtauglichkeit der zum einjährigfreiwilligen Dienst berechtigten Wehrpflichtigen Deutschlands.) Schwiening.

79. **Experiments on the Growing Eye.**—Wessely has been examining the influence of various operations on the eye before it has reached its full development. The results show that by transferring experimental research from adult to very young animals a new field is thrown open for investigation in various lines, not only for the eye but for other organs. The growing organ reveals the action of external influences much more instructively than the mature.

85. **Primary Pyelitis.**—Saathoff reports 2 cases of pyelitis with a special Gram-negative bacillus responsible for the process. The special feature of the cases was the involvement of the adjacent tissues in the infectious process; in one patient the infiltration spread through the entire upper left abdomen, in the other the inflammation spread to the veins in the thigh and leg. Notwithstanding this extensive spread of the process, the virulence did not seem to be very great; the general condition persisted remarkably good and there was no loss in weight during the four weeks of fever until the venous thrombosis developed. Suspicion of tuberculosis of the kidney proved unfounded.

87. **Tuberculin Vaselin for the Ocular Test.**—Wolff-Eisner now uses a 1 or 2 per cent. tuberculin vaselin for the ocular test, and states that the mixture keeps perfectly for months, while it is fully as convenient as a solution for the ocular test.

Therapie der Gegenwart, Berlin

November, L, No. 11, pp. 505-552

91 *Treatment of Obesity by Vegetable Diet. (Entfettung durch vegetarische Diät.) A. Albu.
92 *Serum Sickness. (Zur Aetiologie und Prophylaxe der Serumkrankheit.) H. Ohnacker.
93 *Combined Electric Method of Treating Cancer. (Neue Behandlungsmethode bösartiger Geschwülste.) C. Müller.
94 Diagnosis and Treatment of Injuries of the Eye. (Augenverletzungen.) C. Adam.
95 Radioactive Therapy. (Erfolge mit Kreuznacher Radium-Emanationsbädern und lokal angewandten Radiol-Präparaten.) Kemen.
96 Local Massage of Rectum in Treatment of Habitual Constipation. (Schwedische manuelle Mastdarmbehandlung als Therapie bei sehr hartnäckigen Fällen der habituellen Obstipation.) von Akerhielm.
97 Circumcision. E. Schlechtendahl.

91. **Treatment of Obesity by Withdrawal of Meat.**—Albu has found a strict vegetable diet extremely useful in obesity. He believes that it is the easiest, safest and most effectual means of correcting the tendency to undue corpulence without impairing the general health. The aim is to satisfy without giving many calories, and beverages are allowed unrestricted. He gives tables of the calorific value of vegetables with menus for the various seasons. Vegetarians never present the picture of full cheeks and rounded outlines, the difference being mainly in lesser deposits of fat, just what is needed in treatment of obesity. Albu keeps the patient on a strict vegetable diet for from 4 to 6 weeks, then allows from 150 to 200 gm. of lean boiled meat 3 times a week or once a day. This diet is kept up for months without trouble, and protects those inclined to obesity from returning corpulence. If the weight begins to increase he drops the meat again for 4 or 6 weeks. He generally supplements the dietetic regulations by exercises and hydriatic procedures, but these alone are insufficient. He gives the records of several cases in which the weight dropped nearly 40 pounds in the course of a few months by this dieting alone. Fatty heart and digestive disturbances are the main contraindications.

92. **Serum Sickness.**—Ohnacker noted that 21 out of 40 diphtheria patients showed signs of serum sickness, all being injected with No. 178 antitoxin. Tests of this antitoxin showed a peculiar tendency to induce a reaction beyond that of other numbers, the tests showing exanthem in 74 per cent., while it occurred in only 4 per cent. with antitoxin of another date. The antitoxin was tested by injecting 0.1 c.c. into the skin by the Schleich infiltration technic. Besides the 100 cases thus treated, a number of control tests were made on other persons with salt solution and human serum, with and without a preservative. In another series the antitoxin No. 178 was injected into the left arm and antitoxin of another date into the right; a reaction was observed in 77 per cent. on the left and in only 5 per cent. on the right arm. He concludes from all this research that the serum sickness is due to some prop-

erty of the serum used and not to any property on the part of the one injected, although some patients are naturally a little more sensitive than others.

93. **Combined Electric Method of Treating Cancer.**—Müller reports a case which has attracted attention, as the tumor on the back of the head had been examined by a number of physicians in Berlin, the general verdict being inoperable sarcoma. The tumor was as large as a child's head, and the glands in the neck were swollen. The cachexia and loss of 41 pounds in a few months, and inefficacy of potassium iodid confirmed the assumption of malignant disease, but the extension from the vertex to the neck and over the parietal region forbade the thought of an operation. Roentgen treatment was energetically applied, combined with application of high-frequency electric currents of high tension. Müller has been successful with this combined method in a number of small superficial tumors and in this case the tumor retrogressed after the third sitting so that the skin lay in folds, and by the tenth the entire tumor had vanished, nothing being left after the twelfth sitting but a minute nodule behind one ear. The glands in the neck had subsided to normal size by the eighth sitting. He used water-cooled tubes so that there was no sign of an *x*-ray burn. The scalp was rubbed with alcohol and greased during the treatment, but this was the only medication. The hat band of 65 cm. is now reduced to 58 cm., and the patient has gained 24 pounds in weight. Klemperer confirms Müller's statements, having had the patient in his charge and having informed the family of the fatal prognosis. The greater was his astonishment when the patient returned four months later in robust health and no trace of the tumor. No microscopic examination was made. In this preliminary communication Müller gives no more than the above description of his technic.

Wiener klinische Wochenschrift, Vienna

November 4, XXII, No. 44, pp. 1507-1546

98 *Relations of the Internal Secretions to Surgical Conditions. Roswell Park.
99 *Stenosis of the Pylorus and Roentgen-Ray Diagnosis. (Entwicklungsstadien der Pylorusstenose und ihre klinisch-radiologische Diagnostik.) S. Jonas.
100 Sporotrichosis. O. Kren and M. Schramek.
101 Improved Technic for Determination of Hemoglobin. (Eine Verfeinerung der Fleischlschen Hämoglobinmessung.) M. Herz.
102 *"Thermopenetration." E. v. Bernd, W. v. Preyss and E. Eitner.

November 11, No. 45, pp. 1547-1584

103 *Opsonic Index and Technic of Tuberculin Treatment of Tuberculosis. (Opsonischer Index und Tuberkulosetherapie nebst Beiträgen zur Technik und Dosierung der Tuberkulininjektionen.) K. K. Kössler and W. Neumann.
104 *Transmission to Monkeys of Ophthalmia Neonatorum without Gonococci. (Uebertragungsversuche von gonokokkenfreier Blennorrhoea neonatorum auf Affen.) K. Lindner.
105 Experimental Research on Kidney Functioning. (Experimentelle Studien zur Nierenfunktion.) R. Lichtenstern and A. Katz.
106 Unusual Dislocations. (Zur Kasuistik der Luxationen.) M. V. von der Lilie.
107 Flagellates in Human Intestine. (Flagellaten im menschlichen Darme.) U. Guastalla.
108 Scleroma and Osteoma of the Trachea. H. Peters.

98. This is a translation of an article published in *Northwest Medicine*, August, 1909.

99. **Stenosis of the Pylorus and Roentgen-Ray Examination.**—Jonas writes from the Roentgen laboratory of the general hospital at Vienna to call attention to the importance of the discovery of antiperistalsis as a sign of incipient stenosis. It is readily distinguished with Roentgen examination and the bismuth taken for the purpose supplies the best conditions for determining the peristalsis if the patient has eaten a roll or its equivalent before taking the bismuth. The antiperistalsis is the radiologic equivalent of the impending but not yet developed "rigidity of the stomach" (*Magensteifung*). This first stage of pyloric obstruction consists merely in moderate distention of the caudal part and antiperistalsis, but there is as yet no atony of the fundus, no profuse vomiting nor colic. As compensation fails, vomiting occurs and the fundus shows atony, while in the ultimate stage the caudal part is extremely dilated, with other signs of stagnation.

102. **Thermopenetration.**—Considerable interest has been aroused by this method of inducing heat in the depths of the tissues by the local resistance to the passage of high-frequency currents. Bernd has applied the measure 2,000 times, but warns that the technic requires practice on the cadaver and on animals before it can be safely applied to man. He uses it in gonorrheal, rheumatic and other affections in which local application of heat promises good results. Tuberculous affections do not seem to be influenced, and it does not seem to be able to destroy the gonococci in the urethra but is proving useful in the complications of gonorrhea in the male.

103. **The Opsonic Index During Tuberculin Treatment.**—Kössler and Neumann tabulate the findings in 18 cases which seem to show that the opsonic index is of comparatively little moment as a guide in tuberculin treatment.

104. **Non-Gonococcus Ophthalmia in the New-Born.**—Lindner reports from Fuchs' eye clinic that he has been able to infect monkeys with the secretions from ophthalmia neonatorum, free from gonococci but containing cell inclusions, such as Prowazek has described as trachoma bodies. The course of the transmitted affection resembled in every respect that of transmitted trachoma. Consequently, he asserts that in these cases of ophthalmia neonatorum, the trouble is evidently a form of trachoma affecting the conjunctiva of the new-born, no matter whether the granules of the inclusions are to be regarded as a specific product of the reaction to the causal agent or as the causal agent itself.

Zentralblatt für Chirurgie, Leipsic

November 6, XXXVI, No. 45, pp. 1529-1568

109 Successful Rectococcygopexy for Prolapse of Anus and Rectum. E. Bircher.

Zentralblatt für Gynäkologie, Leipsic

November 6, XXXIII, No. 45, pp. 1553-1584

110 Management of Childbirth with Moderately Contracted Pelvis. (Therapie bei Beckenverengungen mittleren Grades.) H. Kupferberg.
111 Medicinal Treatment of Sterility from Infantile Conditions. (Vorschlag zur medikamentösen Therapie der infantilistischen Sterilität.) H. Bab.
112 Formation and Significance of Lacteal Glands in Axilla. (Zur Bildung und Bedeutung der Achselhöhlenmilchdrüsen.) Geyl.

Gazzetta degli Ospedali e delle Cliniche, Milan

October 26, XXX, No. 128, pp. 1353-1360

113 *Neurosis of Sympathetic System during Measles. (Di alcune nevrosi del simpatico riscontrate durante l'infezione morbillosa.) S. Licciardi.

October 28, No. 129, pp. 1361-1368

114 Alopecia from Experimental Freezing. (Alopecia temporanea nel coniglio da congelazione.) A. Fontana.
115 Spinal Anesthesia in 579 Cases. (Contributo clinico alla rachistovainizzazione.) O. Ortali.

October 31, No. 130, pp. 1369-1384

116 Diagnostic Importance of Indican in the Urine with Obstruction of Pancreatic Duct. (Comportamento dell'indacano urinario nell'occlusione del dotto pancreatico.) Zuccola.

November 2, No. 131, pp. 1385-1392

117 *The Mechanical and Biologic Factors in the Pathology of Pregnancy. (Il fattore meccanico ed il fattore biologico nella patologia della gravidanza.) L. Mangiagalli.

November 4, No. 132, pp. 1393-1400

118 Antitoxic Action of Calcium Salts in Parathyroid Intoxication. T. Silvestri and R. Montorsi.
119 *Sign of Stenosis of Descending Colon. (Nuovo segno diagnostico delle stenosi neoplastiche del colon discendente.) C. Minerbi and D. De Giacomi.

November 7, No. 133, pp. 1401-1416

120 *Possibility of Immunization against Syphilis by other Venereal Affection. (Sulla eventuale immunizzazione della sifilide.) B. Calabrese.

113. **Neuroses of the Sympathetic System in Measles.**—Licciardi discusses a recent epidemic of measles at Catania which involved young and old; in one family two men of 40 and 47, with a baby had the disease, and several instances were known in which the disease had occurred for the third time. Bronchitis and pneumonia were frequent and severe complications, as also gastrointestinal catarrh, sometimes presenting a syndrome suggesting typhoid and accompanied by signs of meningeal irritation. In several cases he encountered a neurosis of the sympathetic system as he describes in detail in 3 typical instances. One was in a child, nearly 2 years old; during the eruptive stage of measles spasm of the larynx developed. The vocal cords seemed to contract slowly to close the throat completely until the carbon dioxid accumulating in the blood stimulated the respiration center and induced a profound inspiration. The spasm was then suspended for an instant. While considering intubation, mustard to the chest, and bromids, cannabis indica and belladonna were given and in the

course of a few hours the spasm subsided. It returned again two days later when it yielded as before to the same measures. Another child had attacks of typical asthma for the first time during measles; nothing of the kind was known in the family before. In a third child the spasm affected the intestines; the intense pain was not accompanied by any objective signs of trouble but continued unmitigated until relieved by the same measures used in the other cases, bromids, cannabis indica and belladonna.

117. **Biologic Factors in Pathology of Pregnancy.**—Mangiagalli does not regard heart disease as such a serious factor in the pathology of pregnancy as some assume. In his experience the mortality has been only 6.5 per cent. and this only when the food and conditions in general were very unfavorable. The placenta is no longer considered as merely an osmotic and dialyzing membrane interposed between the mother and fetus; it is now known to be an organ with important functions, and biologic factors alone can explain the changes in the kidney with pregnancy. All the organs seem to have their resisting powers in respect to infections reduced during pregnancy, but pneumonia seems to be the most threatening of all. The prognosis is always grave and the effect of artificial interruption of the pregnancy is not felt in time to be of much use in this self-limited disease. This measure, however, he declares, is frequently indicated in case of renal or hepatic complications, but only exceptionally in heart disease.

119. **Sign of Intestinal Stricture from Neoplasm.**—Minerbi reports a case of tumor palpable to the left of the umbilicus with other phenomena suggesting a tuberculous process involving the intestine and peritoneum except for the absence of ascites, fever and response to the tuberculin test. This threw the balance of the diagnosis in favor of cancer, and this assumption was confirmed by the behavior of the tumor when air was blown into the rectum from a bicycle pump. At each stroke of the piston the palpating hand on the tumor felt a kind of expansive pulsation in the tumor similar to the pulsation in the wall of an aneurism in an artery at each systole. This prompt action of the insufflated air was felt only in one side of the tumor, which confirmed the assumption that the growth was a lymphosarcoma in the retroperitoneal glands which in the course of its three years of growth had involved and finally induced stenosis in the descending colon. The factors indispensable for this air-pump sign of stenosis are continence of the sphincter, stenosis not far above and sufficiently pronounced to confine the air, with the walls of the bowel infiltrated with the growth so as to be palpated while some of the wall still retains sufficient elasticity to yield to the pressure of the insufflated air. The discovery of a second small tumor in the epigastrium suggested the lymphatic nature of the cancer in this case.

120. **Immunization Against Syphilis by Other Venereal Disease.**—Calabrese states that he has been impressed with the fact that among a thousand individuals with constitutional syphilis examined who had contracted some other venereal disease during the secondary phase of their syphilis, none had been infected with these other affections before except in a very small proportion, not over 7.5 per cent., and in these there had been an interval of several years before the syphilitic infection. He calls attention to this fact in his experience and urges others to collect information on this point, his impression being that individuals infected with gonorrhea or soft chancre are immune to infection with syphilis. The toxins elaborated by the gonococcus and the Ducrey bacillus, while harmless, comparatively speaking, for the bearer, seem, he asserts, to exert an immunizing power against the pale spirochete capable of aborting incipient syphilis entirely. He is now conducting research in this line, striving for eventual immunization against syphilis by this means.

Policlinico, Rome

October 31, XVI, No. 44, pp. 1381-1412

121 *Carbolic Treatment of Traumatic Tetanus. (Su tre casi di tetano traumatico. Delirio postetanico: cura alla Baccelli.) U. Conforti. Commenced in No. 43.

November 7, No. 45, pp. 1413-1444

122 Modification of the Zammit Milk Test. (Di una modificazione alla lattoreazione de Zammit: Siero-lattoreazione.) G. Pulvirenti.

121. **Phenol in Tetanus (Baccelli Method).**—Conforti remarks that the Baccelli method of treating tetanus is in such general use in Italy and with such constantly good results that no one thinks now of reporting cases any more than instances of recovery from diphtheria under antitoxin treatment. All accept the favorable outcome as a matter of course; the record includes now several hundred cases, with or without associated antitetanus serum. It was his unusual experience to encounter 3 typical cases of traumatic tetanus in the course of one month recently, and he reports them in detail to show the workings of the Baccelli method. [It was described in THE JOURNAL, June 3, 1899, page 1249. The main features are first to cleanse the wound thoroughly with strong antiseptic solution, place the patient in a quiet dark room, plug the ears to keep out unavoidable noises, and give subcutaneous injections of a 2 or 3 per cent. solution of phenol at two or three hour intervals, generally along the spinal column. If the case is of moderate severity, Baccelli commences with 0.2 gm. (3 grains) of the phenol in the 24 hours, rapidly increasing to double or triple this amount. The patient in the grip of tetanus bears astonishingly large amounts of phenol. He claims that it antagonizes the tetanus toxin and quiets the nervous system. In one of his cases 0.72 gm. of phenol was given daily for 6 days, the patient receiving 511 separate injections with lesser amounts in the course of 36 days with final recovery. The text-books mention the Baccelli method, but without much comment, as a rule. Green's Encyclopedia of Medicine, 1908, states that experimental research seems to prove the method valueless, citing Courmont, 1899, von Török, 1900, and Guillaumin, 1902. But French in his "Practice of Medicine," Babes in "Twentieth Century Practice of Medicine," Woods and others have reported encouraging results with the phenol. Woods' article was summarized in THE JOURNAL, Sept. 16, 1899, page 727.—ED.] Conforti supplemented the carbolic injections with the usual sedatives, bromids, chloral or morphin. The incubation had been two weeks in the first 2 cases and the patients, men of 18 and 62, recovered; about 22 gm. of the carbolic acid had been injected in 24 days in the first and 18 gm. in 21 days in the other case. In the third case the patient, a man of 57, succumbed in less than 48 hours after the first symptoms of tetanus after an incubation of one week. The youngest patient exhibited a tendency to hallucinations and mild delirium after subsidence of the convulsions, without fever. Zeri has reported a similar case of a mild, transient psychosis following the tetanus in a patient treated by this method, but Conforti knows of other cases in which the tetanus toxin alone could be incriminated; no carbolic acid had been used.

Books Received

All books received are acknowledged in this column and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. A selection will be made for review in the interests of our readers and as space permits.

INDEX-CATALOGUE OF MEDICAL AND VETERINARY ZOOLOGY, Part 24 (Authors: R to Rizzo.) and Part 25 (Authors: Roack to von Rzewuski). By C. Wardell Stiles, Ph.D., Consulting Zoologist of Bureau of Animal Industry, and Albert Hassall, M.R.C.V.S., Assistant in Zoology, Bureau of Animal Industry. Paper. Washington: Government Printing Office, 1909.

LABORATORY METHODS FOR THE EXPERIMENTAL STUDY OF IMMUNITY. By Eugene F. McCampbell, Associate Professor of Bacteriology, Ohio State University, Columbus, Ohio. Cloth. Pp. 197. Price, $1.25. Columbus: The F. J. Heer Printing Co., 1909.

TRANSACTIONS OF THE AMERICAN SURGICAL ASSOCIATION. Vol. XXVII. Edited by Richard H. Harte, M.D., Recorder of the Association. Cloth. Pp. 628, with illustrations. For sale by Wm. J. Dornan, Philadelphia, 1909.

FIFTH ANNUAL REPORT OF THE HENRY PHIPPS INSTITUTE, for the Study and Prevention of Tuberculosis. Feb. 1, 1907, to Feb. 1, 1908. Edited by Joseph Walsh, A.M., M.D., Paper. Pp. 463.

THE PRACTITIONER'S VISITING LIST for 1910. Flexible leather, wallet-shaped, with flap and pocket and calendar for 2 years. Price, $1.25. Philadelphia: Lea & Febiger.

TRANSACTIONS OF THE THIRTY-FIRST ANNUAL MEETING OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION. Held at Boston, 1909. Cloth. Pp. 406, with illustrations.

INDEX DU PROGRÈS MÉDICAL, 37 e. Année, 1909-1910. Cloth. Pp. 1016. Paris: Progrès Médical, 41 rue des Ecoles.

MORTALITY STATISTICS: 1908. Bulletin 104. Paper. Pp. 133. Washington: Government Printing Office, 1909.